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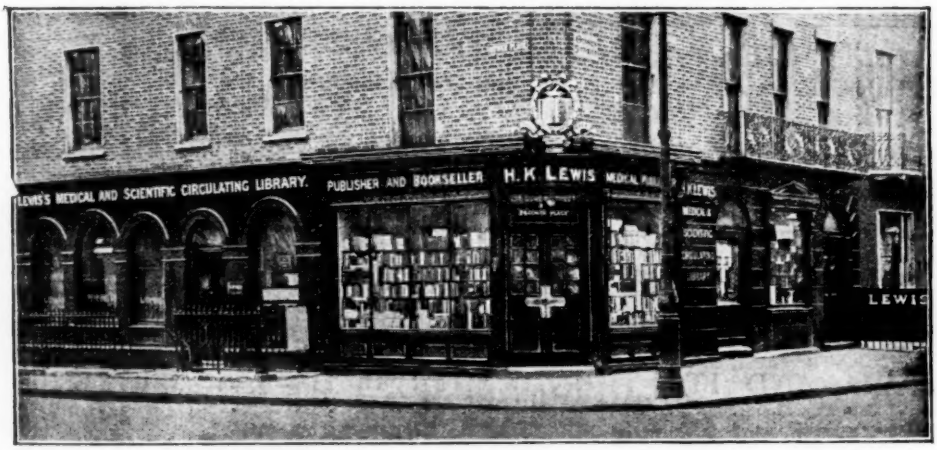


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IT is a simple lesson in anatomy to watch a cook gut a fowl, open the gizzard, wash out the stones, and after turning it inside out she skewers the gizzard under one wing and the liver under the other. The bird is then ready for the front of a fire or the inside of an oven. Boys who have watched the trussing of fowls learn from this simple lesson that cocks and hens are not always gathering grain when they diligently peck about the barn-yard. They pick up also small stones. An inquisitive boy asks: Why do birds swallow stones? and in this way learns the relationship between the absence of teeth in birds and the need of a gastric-mill for grinding the hard seeds they swallow.

## STRUCTURE AND FUNCTION OF THE GIZZARD.

The stomach of most birds consists of a proventriculus, which is glandular, and the gizzard, or grinding portion, which has thick muscles and a hard lining. The muscularity of the gizzard and the thickness of its lining depend entirely on the nature of the food, in the same way that the skin covering the palm of the hand varies with occupation.

John Hunter experimented to find out the nature and use of the gizzard. The gull, a fish and flesh eater, has a thin-walled gizzard, but when fed on grain the walls thicken and the gizzard resembles that of a grain-eating bird. Hunter also noticed that when the gizzard is working the noise of the grinding can be heard if the ear be placed on the side of the fowl—a simple and curious lesson in auscultation. With

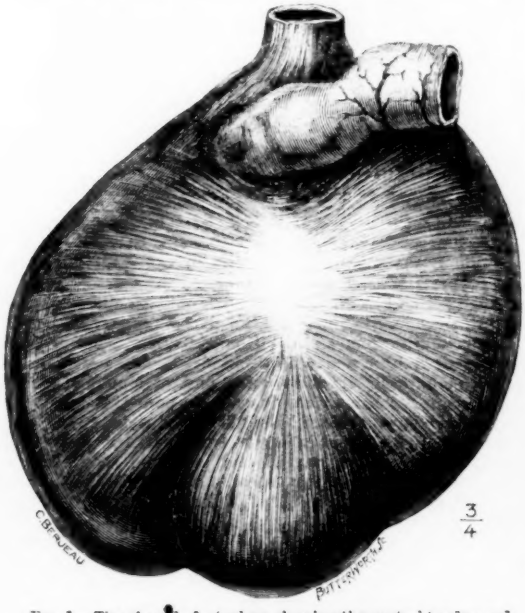


FIG. 1.—The gizzard of a turkey, showing the central tendon and its relation to the muscular bundles.

patience and care cocks and hens soon submit quietly to the examination. Under the X rays the movements of the small stones are easily seen, and without distress to the bird.

The grinding power of the gizzard in some birds is great, for the stones they swallow are polished like pebbles. Birds swallow hard bodies promiscuously. It is not uncommon to find in gizzards pieces of glass and crockery, pins, needles, hooks-and-eyes, and occasionally coins. Pointed pieces of metal sometimes stick through the walls. Birds that live on fish often have the gizzard pierced with fish-bones. The bustard is a grand bird, and at one time common in England. The museum at Salisbury contains two stuffed bustards, reputed to be the last two examples shot on Salisbury Plain. When the gizzards were opened they contained, among other stones, some flint arrow-heads.

The gizzard of the ostrich is big and powerful; this bird shows little sense in selecting objects for swallowing, especially when confined in a menagerie—stones, glass, and glittering objects, especially coins, which it will snatch from the hands of children. William Hunter's collection at Glasgow contains the gizzard of an ostrich with a wooden peg 3 inches long sticking through a hole in its wall. This gizzard also contained pieces of a silver buckle. I found, among other odd things, 49 bronze coins and a fourpenny-bit in the gizzard of an ostrich that had long been in the Zoological Gardens, Regent's Park. The coins were smoothed and some were thinned and edged like knives. An ostrich in the menagerie at Clifton swallowed a Book of Common Prayer and died soon afterwards. Dr. Harrison examined the bird and found the remnants of the book. Nearly the whole of this Prayer Book had been destroyed, but the Thirty-nine Articles were intact; even an ostrich found them indigestible—too many and too much.

One of the most remarkable gizzards among birds is found in the snake-bird or darter; it has a third compartment, known as the pyloric bulb, that leads into the duodenum. (Fig. 4.) The bulb is beset with a thick fringe of hairs serving as an excellent strainer to hinder fish-bones entering the narrow intestine. Snake-birds are voracious fish-eaters. Hairs are sometimes found on the walls of the cuckoo's gizzard, but they have a different origin.

## HAIR BALLS.

The nature and direction of the movement of the stomach have occupied the attention of many physiologists. It is a matter of common observation that hairy animals lick their skins and swallow the hair, which is felted by the motion of the stomach and forms a ball. When such a ball is divided

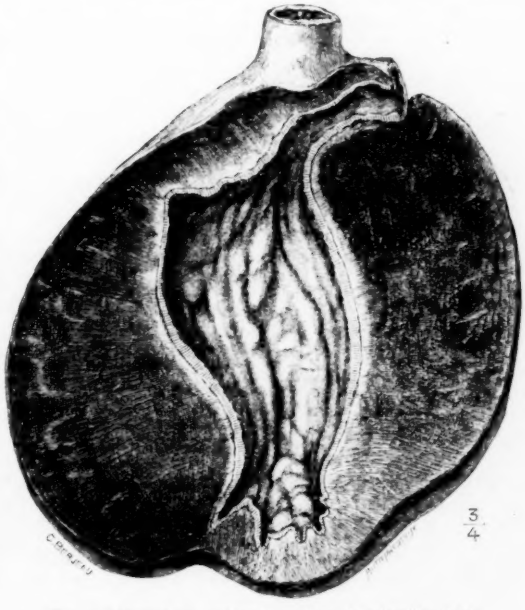


FIG. 2.—Gizzard of a turkey in section, showing the thick muscular walls.

the hairs will be found to lie in the same direction. Hunter noted that this effect could only be produced by a regular motion of the stomach. He studied the arrangement of the fine hairs that are occasionally found in the gizzard of the cuckoo. In certain seasons this bird lives on the hairy caterpillars of the tiger moth known as woolly bears, and the hairs stick on the walls of the gizzard and acquire a regular spiral arrangement due to its rotatory motion

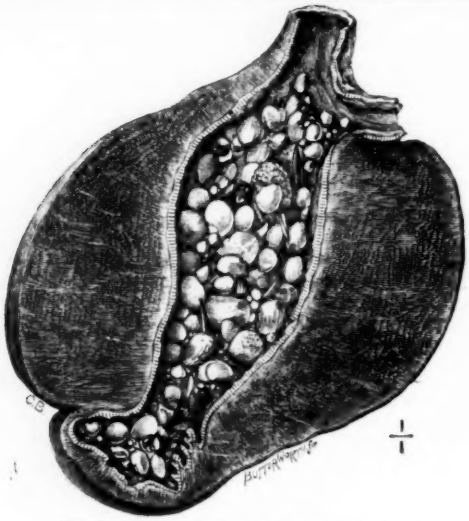


FIG. 3.—Gizzard of a fowl, with stones *in situ*.

### OAT-HAIR CONCRETIONS.

The Hunterian collection contains a number of concretions, irregular in form and of various sizes, found in the great intestine of men and women who lived for the most part in Scotland and the northern counties of England. These concretions, large examples of which may be as big as the fist, are dirty white or brown, smooth externally, and exceedingly light. On section they djsplayed concentric layers of a fibrous substance, felted, velvety to the touch, and with a foreign body, such as a piece of bone, or metal, or a fruit stone, for the nucleus (Fig. 5). Alexander Munro, sen., had in his collection 42 examples of such concretions, varying in size from a pea to masses 6 inches in circumference.

Oat-hair concretions puzzled many until their composition was detected by Wollaston. He found that they consisted for the most part of velvety vegetable fibres pointed at both ends, and this led him to suspect that the concretions arose from some kind of food peculiar to Scotland. Clift, the conservator of Hunter's museum, suggested to Wollaston that the fibres might come from oats, and on examining oats, the vegetable material of the concretions was found to be identical with the fine hair-like bodies within the husks. Portions of oat-husks and other vegetable fibres are found in the concretions, and it was definitely established that they chiefly occur in persons who live upon undressed oatmeal. A century ago oat-hair concretions were common in Scotland, but they are uncommon now, and this is probably due to improvements in dressing oatmeal and the decreased use of it as a food.

FIG. 5.—Oat-hair concretion in section.

Oat-hair concretions occur in horses, usually in the cæcum and colon. The farrier calls them "dung-balls."

### COUNTERFEIT GIZZARDS.

Outside of the bird tribe there are animals with stomachs so modified as to resemble gizzards. The most remarkable are the gizzard trout, the grey mullet, the crocodile, and the ox.

#### *The Gizzard Trout and Grey Mullet.*

Hunter made a special study of the stomach of the gizzard trout and, as lawyers would say, he stated a case which is well worth consideration.

In the gillaroo trout, known in Ireland as the gizzard trout, a portion of the siphonal stomach is thick and muscular for crushing the shells of the freshwater molluscs on which it feeds. The stomach of this trout is more globular than that of most fishes, and endued with sufficient strength to break the shells of small molluscs, but it can scarcely possess any power of grinding as the whole cavity is lined with a fine villous coat.

The grey mullet (*Mugil*) has a stomach that approaches in structure and function very closely the gizzard of a grain-eating bird. This fish has feeble teeth and lives on minute organisms mixed with sand. The second portion of the stomach is globular and thick; the muscular tissue is arranged circularly and equal in thickness throughout, and the stomach has a thick lining.

Hunter came to the conclusion that neither the stomach of the gillaroo trout nor that of the grey mullet can be justly ranked as gizzards; they want "a power and motion fitting for grinding and a horny cuticle." His opinion reminds me of a considered legal judgment on a contentious case. The judge discusses the facts, but does not settle the matter.

It is not easy to frame a definition of a gizzard, and in order to show the difficulty it will be worth while to consider the counterfeit gizzards of crocodiles and oxen.

#### *The Crocodile's Stomach.*

In the beginning of winter 1764 Hunter got a crocodile 5 feet long that had been in a show several years before it

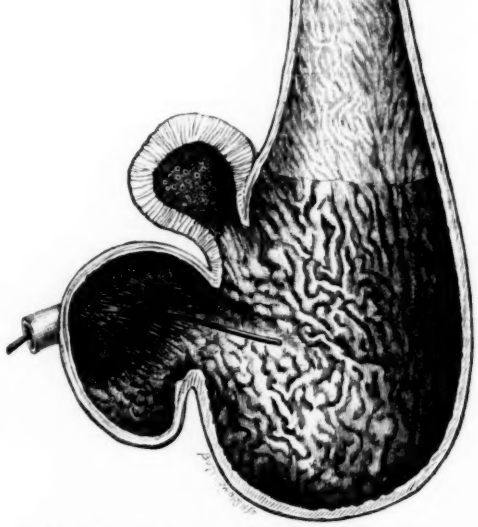


FIG. 4.—Gizzard of a snake-bird, open and showing the hairy strainer in the pyloric bulb. (Museum, Royal College of Surgeons.)

died. At that time crocodiles were rare in London. After making a careful examination of its viscera, he writes: "The crocodile comes nearest to the fowl in the structure of its internal parts of any animal I know. The stomach is of the gizzard kind and has a middle tendon on each side about the breadth of a shilling and all the fleshy fibres pass to it." The stomach of one he had from Jamaica contained the feathers of a bird and a few bones. There were stones in the stomach, some bigger than the end of a man's thumb, and seeds. The Hunterian Museum contains the skeleton of a crocodile shot in the Nile near Silsilis in 1877. The brute, which had been a terror to the natives of a long stretch of the valley, was 16 feet long and reputed to be 80 years old. The stomach contained three hoofs of a sheep or goat, a donkey's hoof, a donkey's bridle, and an ear-ring.

Kermit Roosevelt shot a large crocodile in British East Africa; in its stomach there were sticks, stones, the claw of a cheetah, the hoofs of an impalla, big bones of an eland, and the shell plates of a large river turtle.

A crocodile caught in fishing nets near Khartum lived for seven months in the Zoological Gardens, Cairo. The stomach contained two litres of quartz pebbles, fragments of the hoofs of an ungulate, and piece of water-worn bottle glass. (Shann.) Stones are invariably found in the stomachs of mummified crocodiles. *The presence of stones in a stomach does not make it a gizzard, for pebbles are often present in large quantities in the stomachs of seals and sea-lions.*

*The Omasum of Ruminants.*

If the capacity to grind is the first qualification of a gizzard, the nearest approach to one in mammals is that compartment of the complex stomach of ruminants known as the omasum.

The stomach of an ox consists of four compartments. The first is a large receptacle called the rumen; the second is a recess of the rumen and named, from its likeness to honeycomb, the reticulum; this when cleaned is the choicest kind of tripe. The third compartment, the omasum, is a dilatation of the passage between the reticulum and the fourth compartment, the abomasum, or rennet.

The omasum is curious and complex; it is in a full-grown ox of the same shape and as big as a bladder of lard; the walls are thick and muscular, and the mucous membrane is arranged in folds or leaves (Fig. 6); nearly a hundred leaves hang from its dome, stretching from the œsophageal opening to the entrance of the abomasum. These folds vary in width and produce an appearance like that of the flies of a theatre seen from the stage. The folds earned for the omasum the name of manyplies, and psalterium from its likeness to a book. Butchers call it the bible.

The omasum, like the gizzard, is a triturating organ and the details of its structure were described by Ellenberger (1881). The leaves near the entrance are beset with long papillæ resembling the teeth of a harrow, and hinder the reflux of food to the reticulum. Towards the abomasum the papillæ are shorter, closer set, and flattened, like the low elevations on a rasp or a file. The covering of the leaves is hard, almost horny, and resistant to dilute solutions of acids, alkalis, and peptic juices. The walls of the omasum contract powerfully; grass and sodden hay from the rumen pass between the leaves and are thoroughly rasped by the papillæ before entering the abomasum, the true digestive compartment. The larger part of the ruminant's stomach is like a pocket, non-digestive.

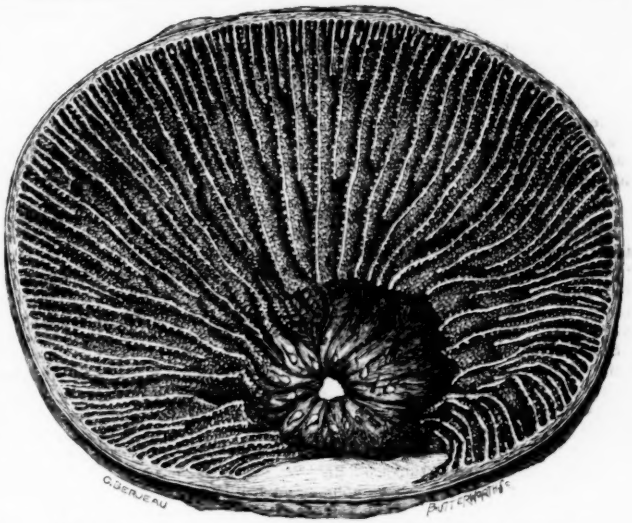


FIG. 6.—Omasum of an ox in transverse section, showing the œsophageal opening and the disposition of the folds.

The leaves of the omasum are occasionally transfixed by needles and pins. Hunter observed that this was common in cows feeding in the grass of bleaching fields, but he did not realise the gizzard-like action of the omasum.

In culinary art few things are meaner than a gizzard. It is only fit for a dog to eat, but to Hunter it furnished food for thought and became the subject of experiment. It has often happened that observations made on apparently common things in nature have led men to investigate some of the most profound problems of physics, of which life is the most complex manifestation.

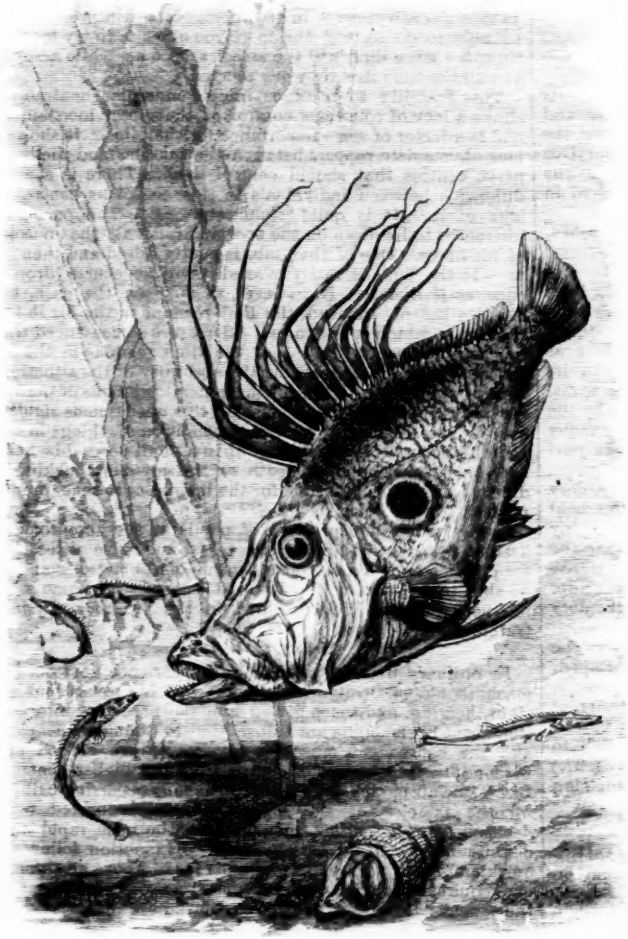


FIG. 7.—The dory, *Zeus faber*, and the 15 spined stickleback.

POST-MORTEM DIGESTION OF THE STOMACH.

Why does the stomach not digest itself? Many have asked this question. John Hunter about 1772 discovered that the stomach sometimes digests itself after death. His first observation was made on a man who had been killed by one blow of a poker, after taking a hearty supper of cold meat, bread, cheese, and ale. The stomach was dissolved at the cardiac end and a considerable part of its contents lay loose in the general cavity of the belly. The second case occurred in a man who died after receiving a blow on the head which broke his skull. Hunter subsequently found another example in a man who had been hanged.

These observations led him to procure the stomachs of vast quantities of fishes whose deaths are always violent, and they are at the time in perfect health and usually with their stomachs full. In some instances a fish will swallow another fish and a part of it will be in the stomach and a part in the gullet. The part of the fish in the stomach will be dissolved, while the piece in the gullet remains sound. In many of the instances the digesting part of the stomach was itself reduced to the same dissolved state as the digested food. Then it struck him that the stomach, being dead, was no longer capable of resisting digestion.

Self-digestion of the stomach has been studied by pathologists. Modern experiments prove that gastric juice is only poured into the stomach when the material to be acted upon makes its appearance therein. When a person dies with the stomach empty it may be found several days after death unaltered. If there be food in the stomach and the digestion process in operation when the person dies, then on examining the organ a few hours after death its coats may be found destroyed, allowing the contents of the stomach to escape into the belly.

*Animals which Swallow their Prey Alive.*

Hunter's observations on post-mortem digestion of the stomach led him to experiment on digestion, and the "pursuit led him into an unbounded field." He discusses the probability of live animals being digested, and at once states, "no fresh proofs are necessary, as we eat oysters every day." This is no proof that they are digested alive.

Snakes sometimes swallow their prey alive. A girl whom I knew kept tame snakes as pets. One day she took a grass-snake and two tree-frogs in a basket to amuse her friends. On opening the basket she could only find one frog and the snake; but a bulge on the snake indicated its position, so she promptly cut off the snake's head and released the frog by a post-mortem cœliotomy. The frog survived delivery. Here is another instance. Two boas, companions in the same cage in the Reptile House at the Zoological Gardens, London, seized the same rat at 6 P.M. These snakes were nearly of the same size. At 6 o'clock the following morning only one boa was visible, but the officer in charge saw the tail of a snake sticking out of the mouth of the boa. A keeper seized the tail of one snake; another keeper dragged on the tail of the snake that had been swallowed and gradually released it. An hour after extraction this boa took a rat on its own account and in good style. What would have happened to the incarcerated snake if it had not been delivered is not a matter for surmise: it would have been digested, as the following incident proves:—

Some 20 years ago a Madagascar boa swallowed a boa, its companion boa of nearly the same size, retained, and digested it. Two weeks later I made a search among the pebbles at the bottom of the cage in which the survivor lived and collected some of the vertebræ belonging to the victim. All the soft parts had been thoroughly cleaned in the process of digestion.

I have often thought that live animals, such as fishes, frogs, lizards, and chameleons, when swallowed by storks, bustards, shoebills, or secretary birds, must have an uncomfortable time in stomachs of their captors, and have pictured to myself the agony of being digested alive or slowly ground to death in a gizzard mill. At sunrise I watched some birds fishing in a swamp of the White Nile near Tewfikia. One of the men shot a marabou, and in its stomach I found seven cat-fishes each the size of a sprat. They were dead. The back of each had been broken by the powerful bill of the bird. It is a fair inference that many fishes swallowed by birds are either killed or paralysed before they reach the gizzard.

Fishes do not always kill the prey they swallow. A dory living in an aquarium with a 15-spined stickleback was bold enough, after some consideration, to swallow its spiny companion, and for a few seconds tried hard to bear the tickling; it was beyond his power and he vomited the stickleback, which seemed none the worse for the adventure. In recording this event, Hornell states that when the dory stalks a fish the coloured bands on his sides intensify and darken. The dorsal fin goes up and with a swift dash—the great telescopic mouth is thrown out—and the prey is gulped. (Fig. 7.)

The black mark on the side of the dory is, by fishermen of Roman Catholic countries, regarded as the mark of Peter's thumb when he seized the fish and "opened his mouth" to find the shekel wherewith to pay the tribute. (Matt. xvii. 27.) Those who believe this tale forget that the Sea of Galilee is a freshwater lake and the dory a salt-water fish.

ROYAL INSTITUTION.—A general monthly meeting of the members of the Royal Institution was held on Feb. 3rd, Sir James Crichton-Browne, M.D., LL.D., F.R.S., treasurer and vice-president, in the chair. The chairman reported a bequest of £300 from the late Dr. T. Lambert Mears, who was a member of the institution for 53 years.

# MEDICAL ASPECTS OF AVIATION.[1]

BY L. E. STAMM, B.A., B.SC., M.D. LOND., R.A.F.

[AFTER taking a brief survey of the necessary physical qualities to meet the special conditions of stress and strain in the air, Dr. Stamm dealt with the mental qualities in more detail.]

*Conscious Control of the Muscles.*

We must first refer to the nerve mechanisms which subserve the mental functions. We have, in the first place, the sense organs of sight, hearing, and touch, also the muscular sense and sense of equilibrium. It is most essential that each one of these senses should function in a normal manner, and they are all tested in the course of medical examination.

In regard to the motor mechanism, it is important that the muscles show good tone and a power of nice control and adjustment. Deficiency in this respect is usually characterised by the pilot instructor as "heavy on controls." Such natural inherent clumsiness is a bad quality in a pilot, and means have been devised to test for this on the ground; but there is another deficiency which has not received much attention, but which I think is of some importance, and that is "conscious control of the muscles." A Mr. Matthias Alexander has developed the subject, and is disposed to ascribe all the ills of humanity to this lack of "conscious control." It is a fact, although it would be a surprise to most to learn it, that very few people have full conscious control of their muscles, and it can be demonstrated in this way: If a person is told to move a limb in any direction he will do so, but if he be told to relax the muscles of any limb so that *you* can move it in any direction he will probably not be able to do so, and the more you ask him to try to relax them the more rigid will the muscles become, while assuring you all the time that they are relaxed.

This inability to relax or inhibit muscular contraction shows a lack of conscious control of the motor mechanism, and is a factor of some importance for the pilot. It shows a lack of complete *rapport* between the muscles and the brain nerve centres that should control them. There is a great difference between individuals in this conscious control or lack of it. It is quite simple to test. The person is instructed to lie down on the floor and relax all the muscles of his limbs. One of the limbs is gently raised and then let go. If the limb is really relaxed it will, of course, drop at once, as if lifeless. If, however, as is often the case, the muscles are not relaxed, the limb remains in the air in the position to which it was raised. Some are so convinced that the muscles are relaxed that the limb remains in the air without its possessor realising the absurdity of the situation. Apart from the importance of the general principle of perfect *rapport* between brain and muscles, this unconscious rigidity may be responsible for a serious condition of things in the air in the course of training, as when a pupil loses his head and hangs on like grim death to the joy-stick, making it difficult or even impossible for the instructor to take proper control.

In my medical inspections of pupils at the aerodrome I used to test for this ability to relax and give directions for practice to obtain a proper control of the muscles and to be able to relax at will. I would suggest that some such instruction should be embodied in the ordinary physical training.

*Mental Qualities.*

In ordinary flying a pilot of any experience controls his machine automatically—that is to say, his sensations of sight, hearing, and touch giving him the necessary information about his machine are transmitted to the nerve centres, and the consequent muscular movements are carried out without any interference or control from the higher centres. But in the air circumstances are continually occurring calling for the exercise of the higher centres connected with decision, discrimination, judgment, in the most rapid and definite manner. At certan times rapid action following quick and right judgment decides his fate. Above all things, one requires for a good pilot a mental constitution that has the capacity to take in all the circumstances of a situation

[1] A paper read before the Royal Aeronautical Society at the Royal Society of Arts on Jan. 15th, 1919.

quickly and correctly and make a rapid and correct decision. When the engine conks the experienced pilot automatically puts the nose of the machine down and looks to his pressure gauge, and with his conscious mind looks around and takes in the conditions before him for a forced landing, and decides upon his course of action. For the inexperienced pilot some of the necessary actions, such as observation of pressure gauge, may not be automatic, so that there is still more to occupy the conscious mind.

For all this one requires not only a quick and accurate coördination between the senses and the muscles, but also between these and the higher mental functions.

A quick coördination between the senses and the muscles can be tested by taking the "simple reaction time," that is the interval of time that elapses between a person receiving a signal, either visual, auditory, or tactile, and his response to the signal, in the form of some movement, such as pressing an electric key. In my opinion, testing for this "simple reaction time" is of little or no practical value for the Air Service, because in healthy young men with normal senses and muscles the coördination between these and, therefore, the "reaction time" is sufficiently quick and accurate for all practical purposes, and in actual experience I have obtained some comparatively slow reactions from very capable individuals and very quick responses from some of poor mentality. In candidates for the Air Service I do not think these simple reaction time tests would eliminate 1 per cent. of undesirables.

What one requires to test is the ability of the candidate to respond quickly and accurately under conditions in which the higher *conscious* mental functions of discrimination, decision, and judgment are involved. For this purpose one has a number of different signals, requiring different responses, the candidate not knowing which signal to expect. This necessitates the intervention of the conscious mind between the perception of the signal and the motor response, and consequently the reaction time is lengthened. The mental ability is tested by the rapidity and accuracy of response in proportion to the complexity of the problem presented to the candidate.

Many forms of apparatus have been devised, but as the interval of time is only a fraction of a second and variations are measured in 1/100ths of a second some difficulty has been found in obtaining accurate and reliable apparatus that is also sufficiently simple for practical purposes. With the help of Major Burgess, engineer, R.A.F., I have devised an apparatus which is comparatively simple and which in practice has proved of value in testing candidates for the Air Service. A diagram of the apparatus is shown.

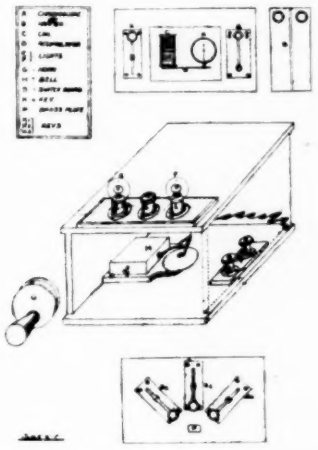
*Reaction Time Apparatus.*

It consists of a chronoscope, $A$, which registers to 1/100th second, and is worked electrically by a hammer, $B$, from a coil, $C$, and accumulators, $D$. There are four signals, two differently coloured lights, $E$ and $F$, an electric horn, $G$, and an electric bell, $H$. The operator has a switchboard, $S$, by which any one of the signals is put in the current, and the signal is given by touching the key, $K$. The candidate sits opposite the operator and places his right-hand first finger on the brass plate, $P$, which is equidistant from the three keys, $K_1$, $K_2$, $K_3$. The end keys, $K_1$ and $K_3$, are for the corresponding lights, and the middle key, $K_2$, is for the horn or the bell. It was not considered desirable to complicate things to the extent of four keys.

When the operator presses his key, $K$, one of the signals is given, and at the same time the chronoscope starts. The candidate responds by touching the appropriate key, $K_1$, $K_2$, or $K_3$, which stops the chronoscope, and the reaction time is read off in 1/100th seconds.

The method of examination is as follows. After a short preliminary rehearsal to acquaint the candidate with the method of working the apparatus, the candidate is tested for the simple "automatic reaction time" by one signal, which he knows beforehand. He is tested in this way by a series of each of the four signals. As already stated, I set no value on these tests, but they enable the candidate to get used to the apparatus. After testing for the simple reaction time with each separate signal the candidate is now told that he may get either one of the two lights, and he is to respond by touching the appropriate keys, $K_1$ or $K_3$. Having done a series of ten with the two light signals, he is now given a series with three possible signals, the two lights and the horn, and finally a series of all four signals—two lights, horn and bell—but for the bell for which he has previously used the middle key, $K_2$, he is now told to keep his finger on the brass plate. This involves mental inhibition. Each series shows an increase in the reaction time, owing to the increased complexity of the problem before the candidate. Recently I have used a further series of four signals, in which the keys previously used for the lights, each corresponding to the light on the same side, are now reversed. This further complicates the problem and causes a further increase in the reaction time.

*Diagrammatic Representation of the Reaction Time Apparatus.*



The following are (1) the averages of 150 cases, including pupils and instructors (good pilots) and (2) of 20 instructors (experienced pilots), for the different tests in 1/100th seconds. The latter yield, as would be expected, appreciably lower figures:—

| | (1) | (2) |
|---|---|---|
| (1) Simple visual reaction (one signal) ... ... ... | 28 | 27 |
| (2) ,, auditory ,, ,, ... ... ... | 26 | 25 |
| (3) Two signal test (two lights) ... ... ... ... ... | 35 | 32·4 |
| (4) Three ,, (two lights and horn) ... ... ... | 38 | 34·5 |
| (5) Four ,, (two lights and two sound signals) | 44 | 40·4 |
| (6) ,, ,, (with keys to lights crossed) ... | 48 | 46 |

Taking the last two tests as the crucial tests of the mentality of the pupil, I have found a remarkable correspondence between the results and their capacities as flying pupils. Having tested a certain batch of pupils, I send the names to their instructors and ask for their opinion as to their flying capacities and possibilities of making good pilots. Arranging them in the order of the results from the machine, as a general rule the top names have "very good" or "good" against them, the middle ones "fair" or "average," and the bottom ones "poor" and probably "turned down" or sent to "heavier machines."

Appended is a list of pupils examined, with the results of the test and the criticisms of their instructors, from which the value of the test can in some measure be estimated.

I should point out that with my apparatus there is a muscular adjustment involved in the movement of the fingers to the different keys. In my opinion this is a valuable factor as a further test to the nerve mechanism, but it necessarily prolongs the reaction time, so that even the simple reaction time with my apparatus is longer than the usual without such muscular adjustment. It is quite easy to dispense with this for simple reaction to one signal by placing the finger ready on the key.

*The Value of the Tests.*

The value of the tests lies in the fact that they involve considerable adjustment and coördination between the senses and the muscles and at the same time call for a rapid and accurate working of the higher mental functions of conscious discrimination and decision, a complexity of conditions similar to that involved in piloting an aeroplane. Moreover, it calls for a prolonged effort of attention, and the ability to sustain the effort is shown by the way in which the candidate succeeds in keeping up his rate of response to the end of the tests or shows evidence of mental fatigue by sudden lengthening of the time intervals or by mistakes in the keys.

*Table showing the Results of the Test, together with the Remarks of M.O. and Instructor.*

FLIGHT GROUP No. I.

| No. | 4-signal test in 1/10 sec. | Remarks of M.O. | Instructor's remarks. |
|---|---|---|---|
| 1 | 31 | Haphazard, W.7. | Good, lacks judgment. |
| 2 | 35 | Very intelligent and quick. | Very good—now instructor. |
| 3 | 35·5 | P. 120. Nervy, guts mentally. | Fair—nervy, drinks too much. |
| 4 | 36 | Sturdy, sports, W.3. | Good but slow. |
| 5 | 38 | Sturdy Canadian, horse-riding | Good, quick, guts. |
| 6 | 39·5 | — | Average. |
| 7 | 39·5 | All there—guts. | Good—plenty of guts. |
| 8 | 49·5 | Says upset by 3 instructors. | Poor, no guts, gets sick. |
| 9 | 40 | No nerve physique. | Average. |
| 10 | 41 | — | Very good; steady. |
| 11 | 42 | — | Good. |
| 12 | 42 | Capable, good type. | Extra good. |
| 13 | 42 | — | Average. |
| 14 | 42 | Alert, good type. | Very good—now instructor. |
| 15 | 42 | — | Average, just started flying. |
| 16 | 43 | Intelligent. | Good. |
| 17 | 43·5 | Sports, average intelligence. | Fair—guts. |
| 18 | 44 | — | Average. |
| 19 | 44·5 | Uptake slow. | Good but silly. |
| 20 | 44·5 | Lethargic. | Slow but solid. |
| 21 | 46 | Dumpy. | Average, slow. |
| 22 | 46 | Musical nervy. | Fair. |
| 23 | 46 | Slow uptake, no sports, clerk | Average. |
| 24 | 47 | Slow uptake, no sports, clerk. | Average, slow learning. |
| 25 | 47 | Alert—sports. | Good. |
| 26 | 47 | Nervy. | Poor—windy. |
| 27 | 47·5 | Very anxious, W. 4. | Average, persevering. |
| 28 | 48 | — | Poor, sent to heavier machines |
| 29 | 49 | Windy, paralysed by horn signal, bad type. | Poor—windy. |
| 30 | 50 | — | Average, large flying experience. |
| 31 | 50·5 | Bank clerk, not robust. | Average. |
| 32 | 50·5 | Bright; guts. | Good—lots of guts. |
| 33 | 50·5 | — | Poor. ? Windy. To be turned down. |
| 34 | 52 | Slow but good type. | Slow, but will make good. |
| 35 | 52 | — | Fair. |
| 36 | 52 | Sturdy—rough and ready. | Fair—solid—heavy-handed. |
| 37 | 52·5 | Slow and dull. | Average to poor. |
| 38 | 53 | Nervy, sick on stunting. | Poor. |
| 39 | 55 | Heavy—dull. | Poor, sent to heavier machines |
| 40 | 55·5 | Dull and windy. | Poor, sent to heavier machines |
| 41 | 57 | — | Poor. |
| 42 | 75·5 | Mentality very poor. | Hopeless. |

FLIGHT GROUP No. II.

| | | | |
|---|---|---|---|
| 43 | 33 | Journalist, M.A. Alert, no sport. | Good: previous flying experience. |
| 44 | 36·5 | Average. | Good. |
| 45 | 37 | Good type. | Very good. |
| 46 | 37·5 | — | Good—guts—keen. |
| 47 | 39 | Good type, Canadian. | Very good. |
| 48 | 40 | Good type. | Good. |
| 49 | 40 | Average. | Good. |
| 50 | 40 | Quick but bumptious and over-confident. | Good but objectionable. |
| 51 | 40·5 | — | Average. |
| 52 | 40·5 | Heavy Scotch type—guts. | Average, perseveres. |
| 53 | 41 | Good type. | Very good—now instructor. |
| 54 | 41 | — | Good. |
| 55 | 41·5 | Average. | Good, slow learning. |
| 56 | 41·5 | Bright and intelligent; guts. | Very good and keen. |
| 57 | 41·5 | Accountant; lethargic, heavy. | Heavy handed; to be turned down |
| 58 | 41·5 | Lack of muscular adjustment. | Poor and slow. |
| 59 | 42 | Good type—sport. | Very good, steady and keen. |
| 60 | 43 | ? Windy. | Good but windy. |
| 61 | 43 | — | Average, rather slow. |
| 62 | 43 | M.C. | Good but slow learning. |
| 63 | 43·5 | Heavy. | Good but slow learning. |
| 64 | 44 | — | Keen, lacks judgment, windy. |
| 65 | 44·5 | Nervous temperament, not windy. | Average, keen, guts. |
| 66 | 44·5 | Sports, horse-riding. | Average, keen, guts. |
| 67 | 45·5 | — | Average but slow. |
| 68 | 46 | Good type. | Good. |
| 69 | 46·5 | Good type, Canadian. | Good. |
| 70 | 47 | Average. | Good and very keen. |
| 71 | 47 | — | Average to poor. |
| 72 | 48 | Little stamina, clerk. | Average. |
| 73 | 48 | Average—no sports. | Average. |
| 74 | 48 | M.C., slow. | Good guts—slow learning. |
| 75 | 52·5 | P. 96. Tremors, ? windy. | Average—windy. |
| 76 | 49·5 | Average. | Slow—improving. |
| 77 | 50·5 | Nervy. | Poor—windy. |
| 78 | 51 | Sports. | Poor but guts. |
| 79 | 53 | M.C., not good type. | Very slow; to be sent to heavier machines. |
| 80 | 53·5 | — | Average. |
| 81 | 54·5 | M.C., heavy. W. 5. | Hopeless, turned down. |
| 82 | 54·5 | M.C., heavy. | Poor—very slow. |
| 83 | 54·5 | M.A., bright. W. 4. | Average. |
| 84 | 56 | Slow and dull. | Very poor—turned down. |
| 85 | 57 | Windy—bad type. | Poor—heavy handed. |
| 86 | 58 | Heavy sports. | Average—guts. |
| 87 | 58 | M.C. but guts, drinks too much | Average—guts. |
| 88 | 61 | — | Poor. |
| 89 | 66 | Civil Service clerk. | Poor—slow. |

FLIGHT GROUP No. III.

| No. | 4-signal test in 1/100 sec. | Remarks of M.O. | Instructor's remarks. |
|---|---|---|---|
| 90 | 34 | Alert—bright. | Very good. |
| 91 | 35 | Average | Average, not keen. |
| 92 | 38 | Canadian, good type, sports. | Very good. |
| 93 | 38 | Good type. | Very good. |
| 94 | 38 | — | Average. |
| 95 | 39 | M.A. Good type. | Very good—now instructor. |
| 96 | 40 | M.A. Rather slow in uptake | Very good. |
| 97 | 40 | — | Poor—inattention. |
| 98 | 40 | M.A. Alert. | Good. |
| 99 | 42 | Good type—sports. | Very good. |
| 100 | 42 | Windy. | Intelligent, but no guts. |
| 101 | 42 | Artistic. M.A. | Good. |
| 102 | 43 | — | Good. |
| 103 | 43 | — | Good. |
| 104 | 43 | — | Good. |
| 105 | 43 | — | Fair, lacks confidence. |
| 106 | 45 | Good type—bright. | Good. |
| 107 | 45 | No physique—windy. | Poor, windy and sick. |
| 108 | 45 | — | Average to good. |
| 109 | 45 | Alert and bright, good physique. | Average to good. |
| 110 | 46 | Rough type. | Average to good. |
| 111 | 46 | — | Good. |
| 112 | 46 | Canadian, rather stolid—guts. | Good. |
| 113 | 47 | Canadian, sports, M.A. | Good, but very slow. |
| 114 | 47 | Stolid, but guts. | Good—guts. |
| 115 | 47 | Russian, intelligent. | Average. |
| 116 | 48 | — | Average. |
| 117 | 48 | — | Average. |
| 118 | 48 | Alert—guts. | Average. |
| 119 | 50 | M.B. Slow in uptake. | Average. |
| 120 | 50 | — | Average. |
| 121 | 50 | Slow—stolid. | Good, guts. |
| 122 | 50 | — | Poor. |
| 123 | 52 | Too talkative and plausible, windy. | Average—windy. |
| 124 | 52 | Bright and intelligent. | Average. |
| 125 | 52 | — | Average. |
| 126 | 52 | — | Average. |
| 127 | 52 | Good type Canadian, sports. | Average. |
| 128 | 53 | — | Average. |
| 129 | 54 | — | Poor. |
| 130 | 54 | M.C. | Average to poor. |
| 131 | 54 | M.C., heavy. | Poor. |
| 132 | 55 | — | Poor. |
| 133 | 56 | Haphazard, M.C. | Average. |
| 134 | 56 | Rather heavy but good type. | Average slow but solid. |
| 135 | 56 | Feeble mentally & physically. | Average to poor. |
| 136 | 63 | Poor type. | Average to poor. |
| 137 | 63 | — | Average. |
| 138 | 66 | Slow but sturdy, horse-riding | Average to poor, very slow. |
| 139 | 68 | Charterhouse School, but slow, heavy. | Poor—very slow. |

W. = mistakes in keys. M. = mentality. A, good. B, average. C, poor. Where not stated mentality is average.

Over and above everything else there is the "will" factor to be taken into account. This may act in at least two different ways. It may be negative. Then the results of the tests will not represent the best that the candidate can do. Or it may be very positive. It may be exercised to such an extent that the candidate exceeds for a time his normal power of reaction. In this case the excess of his efforts usually shows itself by mental fatigue setting in before the tests are finished, and he is unable to keep up the pace he has set for himself. All these variations are very useful to observe in forming an estimate of the candidate's mental constitution and capacity.

I would, in fact, claim for the apparatus that it not only gives figures of some value for estimating the mental capacity of a candidate for aviation, but that it affords a means of employing a candidate in a way which gives considerable opportunity of making mental notes in regard to his intelligence and personality, by the manner in which he tackles the machine. Some tumble to the game at once and show a remarkably quick adaptability, whereas others are equally slow in picking up the idea, but may warm up as one proceeds and give quite a good account of themselves in the final tests. Some are light in touch and accurate; others heavy and clumsy, so that they often miss the keys and almost break them when they touch them. I have myself been surprised in dealing with pilots personally known to me to observe how the machine seems to bring out and record their personality, and especially their flying personality. There appear to be two good but different types of mentality which react differently to the apparatus. In the one the reaction times are very quick, but in cutting down the time allowed for discrimination to the utmost in the final tests several mistakes may be made. In the other good type the

reaction times are appreciably longer, perhaps even above the average, but the signals are responded to with absolute accuracy. The flashy, crack scout pilot shows the first type of reaction, while the steady careful pilot is characterised by the second type of reaction.

Any flying man may say, "These tests may be very good, but even if a man has ever such quick discrimination and judgment he is no use as a pilot unless he has guts." This brings us to the second important mental factor—the emotional.

*Emotional Stability.*

We can distinguish two extreme types—one in which disturbance of these centres, by some emotion, whether that of fear, anger, sorrow, or joy, causes a most profound effect upon the rest of the nervous system, resulting in rapid heart action and other disturbances of the circulatory system, rapid respiration or temporary stoppage of same, tremors of the muscles, and an upset of the digestive system; and all this bodily disturbance may be accompanied by an inhibitory effect upon the higher nerve centres, so that the processes of thought, judgment, discrimination, and action are paralysed. In such a type it does not matter a straw whether under normal conditions the individual can think, decide, and act quickly or slowly, because when he is emotionally disturbed by, say, impending danger his mental processes are paralysed and his bodily functions are so disorganised that his machinery is out of control. In the other type the emotional centres are so stable that no such disturbances to the rest of the machinery take place, even under the most trying conditions. There may be, and almost certainly is, some activity of these emotional centres set up, but this results in a stimulation of the rest of the mechanism, so that his powers of thought and action are actually increased.

One has here a striking analogy between the effect of the emotional centres upon the rest of the nervous system and that of drugs; all drugs such as alcohol, opium, and the anæsthetics that have the power of affecting specially the nervous system first stimulate it to greater activity and then paralyse it. If the dose is small the effect is chiefly that of stimulation, and the period of stimulation may be of some duration, but if it be large the period of stimulation is very short or non-existent, and the chief effect is that of paralysis. The difference in emotional effect is again exemplified in artistic performers. In some the emotional disturbance of fear is so great that they are unable to perform in public. In others the emotion serves as a stimulus to help them to do their best.

It is obvious that the individual who is liable to such serious emotional disturbances or, in the language of the Service, liable to get the "wind up," is constitutionally unfitted for work in the air. And here I would point out that such a person is not necessarily a coward in the ordinary acceptation of the term. The condition is constitutional. He may have the mental "guts," the will-power to force himself to incur any risks. He may have proved himself an excellent infantry officer and go into the Air Service with all the desire and determination to win laurels by bringing down Huns in the air, but when he finds himself in the position of danger that he has voluntarily incurred he is handicapped by these emotional disturbances and is not likely to do the best for himself.

*Tests for the Emotional Factor.*

There are, of course, many intermediary conditions between the extreme types I have depicted, with a certain average, but it is most important that we should be able to eliminate at least individuals in whom the tendency to severe emotional disturbance is likely to manifest itself. Various tests have been devised, the principle of which consists in trying to arouse the emotion of fear by some sudden and alarming noise, such as a pistol shot, and testing the bodily reactions, such as increased heart action, muscular tremors, &c. The artificiality of the conditions somewhat vitiates the results.

I have found that the pulse-rate under ordinary medical examination is a very fair guide to detect the "windy" type. People who manifest their uneasiness at coming before a doctor for examination by a rapid pulse, which does not settle down in spite of every effort to put them at their ease, prove by that fact that there is a lack of control of the nerve mechanism of the vital centres, that there is an instability and liability to serious disturbances by the emotion of fear, and they belong to the "windy" type. This instability does not appear to be in the vital centres themselves, but in the higher nerve centres controlling them, because such individuals respond to the ordinary physical test in a normal manner. The manometer test, the exercise test, show a perfectly normal acting mechanism; it is the rapid pulse of emotional disturbance.

Then there is a typical facial expression which one gets well acquainted with in carrying on this work. It consists in a furtive, apprehensive look, as if always expecting something unpleasant to happen, with a certain look of indecision and uncertainty, in marked contrast to the straight, direct, decided expression of the crack fighting pilot. One cannot say that an amount of "windiness" above the normal may not be present without this obvious expression, but when it is well marked I should have no hesitation in throwing its possessor out as undesirable for the Air Service.

It has been found that the bodily expression of an emotion owing to the disturbances in the circulatory system causes a deflection of a sensitive galvanometer proportional to the disturbance, so that this would appear to offer a means of comparing the extent of emotional instability in different persons. The chief difficulty lies in artificially producing the conditions necessary for calling forth the emotion. To some extent my apparatus is a test of an emotionally nervous instability, because in a highly nervous person the ideal of being examined in this way tends to set a condition of stage fright, and I have had cases in which the startling noise of the horn has shown a paralysing effect by causing a pronounced lengthening of the reaction time to this signal as compared with the other signals. But the apparatus is by no means a satisfactory test for the emotional factor, for in actual practice this emotional factor has been the chief disturbing influence in the results of these tests; pupils giving good results with the apparatus may be marked "poor" by the instructor because they are "windy," and others showing long reaction times may be marked "good" by their instructor because they have "guts"! Very frequently, however, I have also detected these qualities by the tests I have referred to and made notes to the same effect.

*Essential Mental Qualities for Aviation.*

We have, then, these two chief mental qualities—quick, accurate judgment and an emotional stability or "guts," or, to use the term in a general sense, "confidence." Now, although instructors lay so much stress upon the "guts" of a pupil, disregarding to some extent the intelligent factor and judgment, in my opinion one requires a nice balance between the two. Crashes occur from two chief causes: (1) "wind up" or "losing one's head," due to loss of control from emotional disturbance of fear in the manner already described; (2) over-confidence in an intelligence or judgment which is below the average and which therefore does not justify the confidence.

The one condition is quite as responsible for disasters as the other. I have cases on record that have given poor results with my apparatus, and of whom I have formed an adverse opinion on account of lack of intelligence on general grounds, education, &c., but who have been marked "good" by the instructor because they have "lots of guts." The verdict of my apparatus has been in the end justified, because the inevitable crash has come. Above all things it is necessary that a man should know his own limitations as well as those of his machine.

It must be admitted that when we have picked out these two important factors of "judgment" and "confidence" and applied our tests for them we have not exhausted the whole subject of mentality. There still remains the general temperament and mental constitution, though these are largely made up of varying degrees of these two functions. We have in any case no further tests, physical or otherwise, that we can apply to discriminate between the various types.

This power of judgment and quick decision does not appear to involve the highest intellectual functions of the mind; it is rather on a par with what we call "tact" in ordinary life. It is the power quickly to take in all the circumstances of a given position and react to it in the best manner—to do the right thing instead of the wrong with quick decision. There is a certain type of highly intellectual person who would by no means take first prize at the tests with my apparatus, but also he would not make a good pilot.

While one may in this way pick out special mental characteristics essential for the successful aviator and exclude anyone specially deficient in any one of them from air service, one must at the same time recognise that there is an infinite variety in the temperaments and mental constitutions of men, and that therefore no hard-and-fast line can be drawn. Just as there are many types of aeroplanes, each more or less useful for a particular purpose and in each of which the designer has had to compromise between the lift and the drift or the speed and the climb, so the pilot of cool judgment, though somewhat slow and deliberate in action, is suited for one service, while the quick, high-spirited, though somewhat emotional, erratic type may be chosen for another, such as the fighting scout. In both cases they may be a compromise in comparison with the ideal pilot.

Aviation requires, above all things, a strong, tough nervous system that can withstand all the stresses and strains, both mental and physical, in the air, that controls well the vital organs, reacts to external conditions quickly and accurately, and is not affected detrimentally by emotional disturbances. Just as one uses the term "physique" to the general development of the body and one speaks of good or bad "physique," so I would suggest the expression "nerve physique" to describe the general tone of the nervous system. There is a general consensus of opinion that a good "nerve physique" is found in young men who have led an outdoor life. Outdoor pursuits not only tend to develop such a nerve physique, but also offer in many ways the best training for aviation by developing their power of observation and quick response, as in the case of riding, shooting, hunting, and, though perhaps in a less degree, almost any sport.

*The Fighting Spirit.*

It has been suggested that the best type of fighting scout must possess the fighting spirit and be capable of developing the emotion of anger with his foe—in other words, must be able "to see red." With this I disagree. In conformity with what I have already said in regard to the emotions, it is my firm conviction that a pilot requires to be as free as possible from any emotional disturbance, whether of fear or anger, and that if he "sees red" his judgment is liable to be clouded and faulty. I must admit that this is to some extent an armchair opinion, but I have sat in a machine taking part in a scrap many times, and I think I have sufficient imagination to fill in the rest of the picture; and as it appears to me, the fighting scout requires the hunting instinct, with all the judgment, cunning, and zest to down his prey, rather than the fighting spirit of "seeing red." It is the man who goes forth in this spirit, aggressive but cool, that is most likely to carry through those nice turns and twists in the right direction and at the right moment that seal the fate of his adversary and render him the victory.

*Alcohol and Tobacco.*

Then there is the much-vexed question of alcohol and tobacco. From what I have already said it will be obvious that it is not only necessary for the pilot to possess a good nerve physique, but to keep it up to pitch, and any excess reacts deleteriously upon the nervous system more than on any other part of the body, more especially excesses in drugs such as alcohol and tobacco. Nothing will better contribute to the restriction of these than the ample provision of facilities for out-of-door sports. More especially I would plead for the provision of horse-riding, both for pilots and pupils under instruction. Horse-riding is one of the best physical exercises, and probably comes nearer to controlling an aeroplane than any other ground occupation. I would suggest that every aerodrome should have its stables as well as its hangars, and what better place than an aerodrome for polo? Furthermore, there is a much greater inclination to indulgence as a means of combating conditions of stress or "staleness" from long service. In my opinion no one should be engaged in continual flying, whether as instructor, ferry pilot, or on active service, for more than three months without a complete rest of at least a couple of weeks.

WATER-SUPPLY OF KARACHI.—The President of the Karachi municipality states that ample supplies of water are now available and that the new wells provide a reserve of supply up to twice the consumption even of the period immediately preceding the monsoon.

# SOME SIMPLE TESTS OF PHYSICAL EFFICIENCY.[1]

BY MARTIN FLACK, C.B.E., M.B., B.CH. OXON.,
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I WISH to bring to notice some quite simple tests which I believe will be of use in determining the physical efficiency of an individual. I am approaching this problem from the point of view of a physiologist, and the tests have been devised to show the physical condition, not particularly of any one system, but rather of the individual as a whole.

The procedure has been to select for examination, as far as possible, healthy controls. In this connexion officers of the R.A.F., who have made good and who have been chosen by their commanding officers for their efficiency in flying and in fighting, have been examined and standards have been set, provisionally of course, and may have to be altered. On the other hand, a number of officers who have broken down for some reason or other have also been examined, and the results obtained compared with these healthy controls.

I would like to emphasise that these tests are not designed to supplant the work of the clinician in any way, and when a man is reported as physically unfit on these tests it does not mean that the work of the physician is finished, but that it is beginning. If the subject does not come up to the standards on being overhauled by the applied physiologist, then the psychologist, neurologist, cardiologist, or general physician will find something is wrong with him. These tests give indications for such overhaul.

The chief point in connexion with these tests is the technique. This is important because, if adopted, it is essential that all the tests be carried out in the same way on all occasions, so that various medical officers may apply them to the same individual at different times. It has been suggested in regard to the care of officers in the R.A.F. that preventive treatment is best. If officers were periodically subjected to these tests by medical officers at different stations they would carry with them a certain definite amount of information as to their physical condition at the time of the various examinations.

*Description of Tests.*

The first test is the *response of the pulse to exercise.*

It is of importance the way this is done. I would point out that there is no limit to the number of times a man may be asked to stand upon a chair, but the technique here suggested is suitable to the examination of a large number of subjects. The test is that a man shall lift his body weight through a definite height five times in 15 seconds. The rate of increase in the pulse as a result of the exercise is noted and the rate of return to the normal, the pulse having been taken standing immediately before the exercise. In this way uniformity of observation is obtained. Hitherto, if ten medical officers were examining candidates, some might order the candidates to touch their toes four times: the enthusiastic man would do so in 5 seconds, the lethargic man in 20 seconds. The test as devised is an effort to set a level basis for all candidates. Preferably the sitting rate of the pulse is first taken. The pulse-rate is then taken standing. If the rate is unsteady it should be counted in periods of 5 seconds until a steady rate is obtained.

The candidate is then put through a regulated exercise, which should be carried out as follows: Standing before a chair, he places one foot upon the seat of the chair and steadily raises his whole body to the height of the seat five times in 15 seconds, one foot being retained on the chair throughout. The examiner should regulate the speed and rhythm in the following way: Standing beside the candidate, holding the wrist, with his fingers on the pulse, the examiner swings the arm forward and backward to indicate the time of raising and lowering the body.

The subject still standing, the examiner then counts the pulse in 5-second intervals, and notes the acceleration and the time taken to return to the previous rate. In a good subject the increase of rate is about 20 and the time of return to normal 15–25 seconds. If the time of return exceeds 30 seconds it is suggestive of cardio-vascular inefficiency.

*The breath-holding test.*—Test No. 2 is quite simple, and consists in getting the subject to hold his breath without any preliminary deep breaths.

[1] A synopsis of a paper read before the Epidemiology and State Medicine Section of the Royal Society of Medicine on Jan. 10th, 1919.

I would insist upon the actual lines on which the test is laid down being followed: A deep expiration followed by the filling of the lungs, clipping the nose, holding the breath as long as possible. The significance of the test should not be mentioned to the subject. He should just be told to breathe out and breathe in as far as possible and then to hold the breath. At the end of the test the question should be asked as to what are the sensations experienced by the subject during the holding of the breath.

The test was originally designed to show whether there was oxygen want, and I still believe the test does show the subject who would suffer from oxygen want. From my experience I found that people who were likely to suffer from "oxygen want" would give up after a very short time in holding the breath and would almost invariably return an abnormal answer. A normal answer would be that the subject "had to give up," "felt he would burst," an abnormal answer that the "blood rushed to the head," "things became blurred," &c. The test, however, has other significance. The man without resolution, for example, will give up early.

As originally shown by Dr. Leonard Hill and myself, if a man who had held his breath in this manner then takes a lungful of oxygen instead of a lungful of air, the time of holding the breath will be increased from 1½ to 2½ times as long. Therefore what one breaks down from is, in the first case, oxygen want, because when one breaks down in holding the breath on oxygen the symptoms are quite different, and are those due to $CO_2$ excess—headache, sweating, &c.

Another interesting point in this connexion is this: It is known that the power to hold the breath is greatly diminished at altitudes. Therefore a man who can hold his breath a long time at ground level without discomfort has greater room for diminution in his power to hold his breath than a man who can hold his breath a short time at ground level before discomfort occurs. An efficient man at altitudes is a deep breather, whereas the man who is inefficient is a panter. Figures in regard to holding the breath were worked out in the first instance on 40 successful pilots, all picked out by squadron commanders, or by the Admiralty, or the R.F.C. as being quite able. The time the breath is held averages about 69 seconds and the sensations experienced normal. The vital capacity averages at 3800 c.cm., with a minimum of 3400 c.cm. in efficient fliers. In a number who were sent up for medical boarding the breath was held for not more than 45 seconds, usually much under, and in most cases the answers recorded were not normal.

The deduction, then, is that the breath-holding test on an individual would be an idea as to whether he was likely to do well in the air. As the results appeared to show that poor breath-holders could not last in the air, the breath-holding test was adopted at the R.A.F. Commissions Board. In my opinion it is preventing people going into the Air Force who would not do well. The question of "oxygen want" is a matter for serious future research, and in peace-time one will be able to do such research on a more scientific basis.

The third test is a combination of the first two tests.

Having got the pulse response to exercise and the time of the breath holding test, then the time the breath can be held after exercise can be taken. In the unfit the breath-holding power comes right down, probably by 30 seconds. The fit man may possibly hold his breath almost as long as before, but will not have a fall of more than 20 seconds. The man out of condition gives a big fall in time after exercise.

The standard for admission for the ordinary breath-holding test was set at 45 seconds. Under 45 seconds should cause the subject to be looked upon with suspicion, and probably graded in regard to the height to which he should go.

*The vital capacity of pilots* —The minimum in the table of successful flying officers is 3400 c.cm.

I suggest that the use of a modified gas-meter is the best way of measuring vital capacity, and preferably one made by an English firm; this has the great advantage over the German model, from which it was copied, that its capacity cannot easily be overshot. Among officers who had broken down a great number of those tested were under the minimum of 3400 c.cm., but it was subsequently found that this was due to flying stress, some having a vital capacity of only 2800 c.cm.

Captain H. C. Bazett, M.C., R.A.F.M.S., has shown that in addition to these tests, if the respiration-rate is multiplied by the ventilation per minute and divided by the vital capacity, it is a very good indication of the power of a pilot to fly. A figure below 30 is good, a figure above 30 poor. A test like this will be of value for the selection of the high flier.

*U tube tests.*—The apparatus for the next test I wish to describe is a U tube manometer filled with mercury, with the scale moveable.

The test is a measure of the tone of the abdominal wall. The subject is asked to blow up steadily the mercury column as high as possible. The number of mm. Hg blown is recorded. If for any reason it is suspected that the subject is not trying, he is asked to try again with the scale of the manometer turned away. There should be but little difference from the previous reading, and in such a case encouragement may cause the subject easily to surpass his previous effort. He is then asked to try again while looking at the column. If he is not trying he will surpass his first effort, which he saw.

The sixth test is another test with the U tube manometer. This test is performed as follows:—

The subject is asked to empty the lungs, fill up, blow the mercury to the height of 40 mm. and hold it there, without breathing, for as long as possible. The nose should be clipped. A valuable adjunct to this test is the behaviour of the pulse during the time the mercury is being sustained. It is counted during each period of 5 seconds that the mercury is sustained. Starting at the 5th second in the normal individual there is generally a slow, steady rise in the rate of the pulse or a fairly marked rise which is sustained most of the time. For example, the pulse-rate may rise gradually from 72 to 96 or 108, according to the time the breath is held, or it may rise at once from 72 to 96 or 108 and be sustained there. A large rise in rate—e.g., from 72 to 132 or 144—is unsatisfactory. In cases of flying stress a characteristic response is for the pulse to jump up to a quick rate during the 5th to the 10th or 15th second and then to fall away in rate to normal or even below. Such a response is as follows:—

Normal at start, 84; 5th-10th second, 144 (sometimes almost impalpable); falling away (say 20-25 seconds) to 72 or even 60. Such cardiomotor instability is frequently associated with flying stress and is indicative of a need of rest. In any case the subject is generally not in a condition to be allowed to continue to fly. Other points in the examination should, however, be taken into consideration.

The averages obtained for these tests from some selected flying officers were:—

Expiratory force ... ... ... ... 112 mm. Hg.
Mercury held ... ... ... ... ... 52 sec.

It is suggested that they should all conform to the minimum standard, and preferably to the average standard.

*Results of Tests in Successful Pilots.*

Table I. gives a synopsis of results obtained from various sources.

TABLE I.

| Subjects. | Number examined. | Breath held. | Vital capacity. | Supplemental air. | Expiratory force. | Sustaining 40 mm. Hg. |
|---|---|---|---|---|---|---|
| | | sec | c.cm. | c.cm. | mm. Hg. | sec. |
| Fit instructors... ... ... ... | 22 | 67* | 4062 | 1620 | 112 | 52 |
| Ditto ... ... ... ... ... ... | — | 46† | 3300 | 1000 | 80 | 43 |
| Home Defence pilots ... ... | 24 | 72 | 3940 | 1496 | 119 | 50 |
| British candidates... ... ... | 23 | 69 | 3823 | 1590 | 106 | 52 |
| U.S. candidates ... ... ... | 7 | 66 | 3814 | 1386 | 116·4 | 53·5 |
| Delivery and test pilots ... | 10 | 57 | 3620 | 1050 | 108 | 40 |
| Pilots returned for rest ... | 17 | 57 | 3897 | 1423 | 95 | 40 |
| Pilots training for scouts ... | 15 | 62 | 3820 | 1433 | 96 | 49 |
| Pilots taken off flying through stress ... ... ... | 27 | 49 | 3480 | 1134 | 74 | 25 |

* Average. † Minimum.
One or two suffering from stress are included among the Home Defence and test pilots.

Practically all the cases examined in hospital fell below the standard. There was one very interesting case, who came with a letter to the hospital and was examined. I told him he seemed very fit, and on reading the letter afterwards found he was still doing very good service in France and had not really come for treatment to the hospital, but for especial examination on account of his fitness and meritorious flying service. Another was a one-eyed man, whose only disability was that he was nearly blind in one eye. I could find nothing wrong by these tests. Many other instances could be given.

*Results of Tests in Rejected Men.*

Having found standards from the examination of successful pilots, I went to the Commissions Board and examined a number of rejects as the result of the routine examination there. The results are appended in Table II.

It will be seen that except one man, who was unfit on the vital capacity test, every man was rejected by the fatigue

TABLE II.

| No. | Age. | Breath held. | Vital capacity. | Supplemental air. | Expiratory force. | Sustaining 40 mm. Hg. | Remarks. |
|---|---|---|---|---|---|---|---|
| | | sec. | c.cm. | c.cm. | mm. Hg. | sec. | |
| 1 | 17½ | 55 | 4200 | 1300 | 80 | 42 | Rejected. |
| 2 | 17½ | 84 | 4300 | 1800 | 60 | 25 | ,, |
| 3 | 18 | 53 | 3700 | 1700 | 55 | 32 | ,, |
| 4 | 18 | 66 | 3800 | 1650 | 130 | 30 | ,, |
| 5 | 17½ | 53 | 2800 | 1000 | 60 | 25 | ,, |
| 6 | 18 | 48 | 3600 | 1650 | 70 | 27 | ,, |
| 7 | 17½ | 44 | 3400 | 1600 | 120 | 35 | ,, |
| 8 | 18 | 85 | 2750 | 900 | 100 | 28 | ,, |
| 9 | 17½ | 71 | 2400 | 1050 | 100 | 50 | Unfit by V.C. standard. |
| 10 | 19 | 50 | 3100 | 1000 | 60 | 20 | Rejected. |
| 11 | 19 | 63 | — | — | 60 | 40 | ,, |
| 12 | 19 | 42 | 3800 | — | 40 | 33 | ,, |
| 13 | 23 | 42 | 4200 | — | 60 | 25 | ,, |
| 14 | 18½ | 64 | — | — | 60 | 33 | M.O. says fit, but does not like him. Referred by assessor. |
| 15 | 22 | 61 | 4100 | — | 100 | 30 | Assessor did not like the look of them. |
| 16 | 23½ | 63 | 4300 | 1800 | 60 | 35 | |
| 17 | 21½ | 55 | 4100 | 1700 | 80 | 37 | History of migraine; referred by assessor. |
| 18 | 18½ | 48 | 3800 | 1700 | 100 | 35 | |
| Average | | 58 | 3650 | 1450 | 77 | 32 | — |

test. Some of these were people whom the medical officer was in doubt about and had sent them for examination, saying he had to pass them fit, but did not like the look of them, though he could see nothing wrong with them.

*Importance of Using Tests in Combination.*

I do not suggest that any one test should be taken in examining a candidate, but that they should be used in combination, and the instructions are that they should be used by the assessor for his guidance.

The results obtained by Lieutenant-Colonel J. L. Birley from pilots who had been fighting for several months and were being sent home for a rest support the results obtained by the U tube test. These pilots were fairly up to the average standard. On the other hand, cases who had been concussed were below average. One has here, therefore, a valuable test for the effect of crashes.

Lieutenant-Colonel Birley obtained from these found permanently unfit for flying the following results:—

Average expiratory force ... ... ... ... ... 76 mm. Hg.
Sustaining 40 mm. Hg. ... ... ... ... .. ... 28 sec.

As I have stated, it is the combination of the tests, however, that is important. The average standards are given in the following table:—

| | Average standard. | Minimum standard. |
|---|---|---|
| Breath holding ... ... ... ... | 60 sec. | ..... 45 sec. |
| Vital capacity ... ... ... ... | 3900 c.cm. | ..... 3400 c.cm. |
| Expiratory force... ... ... ... | 110 mm. Hg. | ..... 80 mm. Hg. |
| Fatigue test (U tube) ... ... | 52 sec. | ..... 40 sec. |
| Pulse response to exercise— | | |
| Increase per min. ... ... | 12–24 beats | ..... 36 beats |
| Return to normal ... ... | 10–20 sec. | ..... 30 sec. |

*Practical Value of the Tests.*

I believe that every pilot could be overhauled by the breath-holding, expiratory force, and U tube tests and a station graded according to its efficiency. As a matter of fact, this has been done. At a certain fighting station the medical officer found that the average for all the pilots by these tests were—

Breath-holding ... ... ... ... ... 65 sec.
Expiratory force ... ... ... ... ... 103 mm. Hg.
Sustaining 40 mm. mercury ... ... 67 sec.

He picked out one officer as being badly off colour, a pilot with 250 hours' experience. The pilot soon after went for a flight, there was nothing wrong with the machine, but the pilot lost contr l, crashed, and was killed. His results for the three tests just previously were—

Breath-holding ... ... ... ... ... 33 sec.
Expiratory force ... ... ... ... ... 95 mm. Hg.
Sustaining 40 mm. Hg. ... ... ... 22 sec.

The medical officer had suggested that this officer should not be allowed to fly. This unfortunate incident so impressed the commanding officer that the medical officer was asked every week to grade the pilots. It soon became evident that the officers who were picked out by the commanding officer or senior flight officer for special duty were practically always those graded by the tests as extra fit. It would seem from this that the selection of pilots for special work by these tests if adopted would be of great value. The commanding officer eventually made a rule that if an officer did not come up to the standard of the tests he must not be placed in charge of a machine. The medical officer then gave him instructions for making himself fit, and he was told if he was still unfit by the tests in a fortnight he would go up for a board, and possibly be found unfit for flying. This was actually done in one or two cases. By this means the efficiency of the station was greatly increased.

I suggest that these tests would also be of value for measuring trench fatigue, industrial fatigue, and fatigue in women workers; also for the grading of people for positions of trust, such as special motor drivers and members of mine-rescue teams. With special standards set according to age, they would possibly also be of value to educational authorities in assessing how children are maintaining their physical efficiency.

# THE TREATMENT OF VENEREAL DISEASE.

BY SIR ARCHDALL REID, M.B. EDIN.;
AND
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EVERY great war has been followed by an increase in venereal disease, so marked that on occasions it has amounted to a pestilence. Unless timely sanitary precautions are taken the greatest of all wars is unlikely to furnish an exception to the rule. We think it desirable, therefore, to give an account of an essay in preventive medicine which, as may be judged from the following, achieved considerable success.

One of us (A. R.) has been in medical charge of a rapidly changing body of men generally numbering about 2000. Up to the end of 1916 venereal disease was common among them in spite of numerous moral lectures and in spite of adequate provision of what is known as "early treatment"—that is, disinfection after the "contact" has returned to quarters. At the beginning of 1917 a new system was instituted. The men were instructed to disinfect themselves immediately after danger had been incurred—just as a surgeon would disinfect his hands. This procedure is what is known as prophylaxis. It differs from early treatment merely in that the man carries the disinfectant and uses it immediately. Each man who applied was given an ounce of solution of potassium permanganate (at first in a strength of 1 in 2000, later in a strength of 1 in 1000), a small swab of cotton-wool, and careful directions. Potassium permanganate was chosen merely because it happened to be the most accessible disinfectant. The rationale of the procedure was fully explained, so that on an emergency the man could purchase the materials from any chemist. During 1917 and 1918 about 20,000 men passed through the station, and among them precisely seven cases of venereal disease occurred, six of gonorrhœa and one of syphilis. Of the six cases of gonorrhœa, two only were contracted by men on leave, in each case from the man's own wife. Two of the others were drunk and took no precautions. The fifth man was infected the night he arrived, and he also, being unaware of the system, took no precautions. The sixth man practised early treatment an hour after intercourse. The man who acquired syphilis also carried no disinfectant, and used it (permanganate and calomel) two hours after intercourse. He had a long prepuce, and therefore a sensitive gland, and probably did not—probably could not—rub in the calomel vigorously.

The other of us (P. H B.) commenced prophylaxis against venereal disease in the Royal Navy in 1907. Some 18 months ago he took over medical charge of an establishment numbering

over 2000 officers and men. The amount of venereal disease, and especially gonorrhœa, was considerable, and it was recognised that of the men who stated they had used the so-called "dreadnoughts" some 40 per cent. contracted the disease. It thus became evident that nargol jelly as a preventive was practically inert. For the past nine months the method of immediate prophylaxis by means of the application of a solution of potassium permanganate (1 in 1000) has been employed with results as striking as those mentioned above in the case of the soldiers. Not a single case of gonorrhœa occurred amongst those employing this method, and only one of syphilis. This latter made the application about six hours after exposure to infection, and may therefore be counted out. Unfortunately, the Navy is a very conservative body, and many men still persist in sticking to the "dreadnoughts." But in lectures given on the subject of prophylaxis men are gradually being convinced of the simplicity and efficacy of immediate prophylaxis.

The calomel cream is still reserved for those who have omitted to carry the permanganate solution on their persons, as it seems likely that the former affords some protection, even if an hour or two has elapsed since the risk of infection has been run.

It will be seen that no man who followed instructions and disinfected himself immediately acquired disease. Evidently the time element is of extreme importance. Probably there is no special virtue in potassium permanganate. Any other active antiseptic would be equally effective. But permanganate is the cheapest disinfectant and the best known to the public, the least poisonous, and least irritating.

# HILUS TUBERCULOSIS IN THE ADULT.

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THE following case, one of many possible examples, illustrates a condition which must be very familiar to all with a wide or prolonged experience of chest disease.

Patient, aged 24 years. History of six months' cough and wasting, night sweats, dyspnœa on exertion, and poor appetite. The patient is very thin and sallow; there is no clubbing. Pulse 128. Temperature 102° F.

*Chest.*—Reflex bands of impairment are present over the backs. (See Fig. 1.) Movement is equal on the two sides. Percussion finds no impairment, but there is double paravertebral dullness, and the apical resonance (Krönig's isthmus) is narrowed to 2 cm. on both sides (normal 4½–5 cm.). There are no crepitations nor râles, the breath sounds are normal, and the air entry fairly good.

A *radiogram* shows "disseminated tubercle of fluffy character (alveolar)," to quote the radiologist's report, through both lungs. On the left side almost the whole field is filled, and there is cavitation just outside the root; on the right disease involves, in the main, the upper half of the lung. The root shadows are very heavy, and suggest glandular involvement.

Six weeks later the signs are similar, but a few crepitations have appeared at the left base behind.

Here we have a "central lung" or "hilus" tuberculosis of broncho-pneumonic type, the counterpart in the adult of a condition which is quite familiar to the pediatrist. Because, on account of its striking symptoms and fatal issue, such a case cannot well be overlooked nor the presence of disease denied, it serves very well to illustrate at the outset the condition which forms the subject of the present paper. If the existence of hilus tuberculosis in the adult had to be proved entirely on grounds of the far more common chronic cases, it might be more difficult to bring convincing evidence of its undoubted occurrence. When, however, a patient obviously "consumptive," presents a chest wall entirely innocent of those crepitations which are considered by many the main sign of tubercle, and yet a radiogram shows advanced and active disease, it seems difficult to deny that we are dealing with a process which has developed in the deep parts of the lung and has not yet involved the surface. If, in addition, before death, crepitations appear rapidly over one or both lungs, as commonly happens, then the evidence for outward-spreading disease is still more convincing.

Now, just as acute apical phthisis is rare, so also is acute hilus tuberculosis compared with the quiet and chronic forms which constitute, to those whose eyes are open to their existence, the main bulk of our tuberculous material. It is particularly to this latter class of case that the writer is anxious to draw attention in the present communication.

But before going any further it must be made clear that the term hilus tuberculosis of adults is not here used to include those evidences of obsolete tubercle which are to be found in every X ray plate and are apt to bulk large in the radiological report on a suspicious chest. Such scars of old battle are accompanied by no symptoms, and give rise to no clinical signs at the surface. True, at the time of their development in childhood physical signs were probably discoverable in some proportion at least of the more marked cases if looked for, but such signs vanished with the passage of years, and it is only when disease is reawakened and a fresh spread occurs that the chest changes to be presently described appear, and the case merits the designation of "hilus tuberculosis in the adult." This awakening of obsolete disease appears to add very little that is distinctive to the radiogram so long as disease is of a quiet and chronic type, and thus it happens that the clinician is in reality better equipped for the diagnosis of hilus tuberculosis of this type than is the radiologist. The former can point to signs indicative of recent disease as confirmation of the symptomatic evidence, the latter must rely solely on the symptoms, unfortunately seldom distinctive, as proof of present activity. This is, however, to anticipate what may be more appropriately discussed later on.

It must be understood, then, that the term hilus tuberculosis in the adult refers to a fresh and active process, involving the deep areas of the lungs where remain the old foci of childhood infection, and thence spreading outwards towards the surface. It thus stands in close relationship to the common form of tuberculosis of childhood, though with less tendency to glandular involvement; and also in decided contrast to apical phthisis of adults, a localised infiltration involving the apex of the lung.

Hilus tuberculosis is commonly a peribronchial disease of chronic and intermittent course—our first knowledge of it we owe to the radiologist, whose "peribronchial phthisis" and "peribronchitis tuberculosa" have referred, as a rule, to this condition. From the clinician it has suffered a scandalous neglect, and it is in the form of a somewhat belated atonement that the writer offers the present communication. Only two contributions to the subject on the clinical side have, up to now, come under the writer's notice, both somewhat inadequate from the point of view of the recognition and diagnosis of the disease. Philippi, of Davos, in 1911, gave an interesting description of "intrathoracic glandular and lung-hilus tuberculosis of adults" (to paraphrase his German heading), and in all but the means for its diagnosis the account is clear sighted and fairly complete. Straub and Otten, in 1912 issued from v. Romberg's laboratory in Tübingen a paper which showed that they recognised the hilus origin of certain clinically "unilateral" cases of advanced pulmonary tuberculosis; they do not deal with the early stages of the disease nor with its diagnosis, and many of their cases occurred in children rather than in adults.

### *Clinical Characteristics of Hilus Tuberculosis.*

Before going into the symptoms and physical signs of hilus tuberculosis in the adult, or its differential diagnosis, it will be well to lay down in the rough the main characteristic points which distinguish it from apical phthisis.

1. *Its bilateral nature.*—Wherever the signs may appear on the surface in these cases the central lung disease is practically always bilateral, though stress may fall for a time more heavily on one or other lung. Its bilateral character is generally very evident to radiological examination; it reveals itself clinically in two directions: firstly, movement of the two sides is very commonly equal or nearly so; and, secondly, there is marked retraction of both apices (Krönig's area) to topographical percussion. (See Figs. 3 and 4.) In both these particulars it stands in marked contrast to apical phthisis, and the latter point, the double apical retraction, provides the means by which it is distinguishable from phthisis on the one hand, and from the chest of health, or of chronic bronchitis, on the other, these being the three conditions under which error most commonly arises.

And now if we look back to the case cited at the opening of this paper, what were the characteristic points to observe? (1) The equality of the two sides in movement and in "contrast percussion." (2) The double narrowing of the apices—only 2 cm. instead of the normal 4½–5 cm. Both these points are evidence of bilateral disease. (3) The absence of crepitations at the surface, evidence of the deeplying location of the disease. And this last point brings us

to the second main characteristic of hilus tuberculosis—namely, the atypical distribution of the signs when they do reach the surface, a point in the diagnosis of cases already advanced.

2. *The atypical location of surface signs.*—Just as in pulmonary tuberculosis of the young child—always a hilus tuberculosis save where a miliary dissemination has occurred—the stethoscopic signs may appear at any point on the chest wall, and no spot is truly characteristic, so in hilus tuberculosis of the adult. When the disease which has been smouldering for so long, too often unheeded, deep in the lung, at long last reaches the surface, it does so at some spot other than the apex of the lung. Very commonly crepitations appear over the front of the chest on one side, often in the axilla, not infrequently at the base behind. Since disease spreads out from the root fanwise along the lung framework towards all points of the surface, it is obvious that it may first reach the stethoscope of the physician at any point. Similarly it must be expected that when disease has reached the surface at one point it will not be far from the surface at other points also. And this brings us to the third characteristic point about hilus tuberculosis.

3. *The characteristic spread of stethoscopic signs over the lung surface.*—Having once reached the surface at one point, the signs, crepitations and the like, tend quickly to spread, unless disease becomes arrested, over the greater part of that side, front and back, often within a comparatively few weeks. On this account it is not uncommon to meet with cases of clinically "unilateral" tuberculosis involving the whole or greater part of one lung and apparently sparing the lung on the opposite side. This unilaterality is, however, apparent only, and a radiogram will reveal disease of little less extent, though often of lower activity, throughout the other lung also. If disease is progressive in this second lung, and it soon becomes so when "tolerance" to autotuberculin fails and fever shows itself, signs will soon appear at this surface also and spread rapidly in area just as on the first side involved. Even before crepitations appear the patient may be dyspnœic and cyanosed from the abundance of deep disease.

Here, then, before discussing its physical signs and diagnosis, we have an outline of the three main characteristics which tend to mark down the hilus origin of a case of pulmonary tuberculosis. No further notice will be taken of cases so far advanced as to give stethoscopic signs at the surface, and, indeed, the majority of cases never reach this stage. The rest of our space will be directed to the symptoms, clinical signs, and differential diagnosis of hilus tuberculosis in its early and curable stages and in its chronic forms.

### *Symptoms.*

Such symptoms as are of toxic origin are identical for hilus tuberculosis and apical phthisis. In addition, certain symptoms occur which may be considered more characteristic of hilus tuberculosis than of apical phthisis. Particularly, shortness of breath on exertion is a symptom which is often prominent, and due in some cases to widespread peribronchial disease and in some to the emphysema and bronchitis which are occasional complications. Chest pain is also fairly common, often in the central regions of the chest, occasionally in the side in association with the marginal pleurisies which are such frequent accompaniments of this disease.

### *Physical Signs.*

A patient comes to his physician with symptoms suggestive of tuberculous chest disease, but on examination no signs are present pointing to the unilateral apical infiltration characteristic of apical phthisis—how is "central lung" or "hilus" tuberculosis to be detected? If this disease is present we shall find the following signs:—

### *Inspection and Palpation.*

On inspection and palpation it will be established that chest movement is equal in the two sides, at least in early stages. In certain cases, however, the stress of disease may fall more decidedly on one lung, particularly the right, or decided pleuritic involvement may occur. Then of necessity a unilateral limitation of expansion is present, as in phthisis, and the characteristic balance of movement is lost.

### *Percussion.*

Through percussion are achieved the main elements of diagnosis.

1. The *reflex bands of impairment* over the backs described by the writer in a former communication[1] as evidence of active parenchymatous disease will be present (see Fig. 1).

[1] THE LANCET, 1915, ii., 387.

2. There may be a slight difference of note between the two sides of the chest to "*contrast percussion*"; and this is commonly against the right side.

3. Often there is present a wide and well-marked area of *paravertebral dullness* on the right side (Fig. 2), a point on which Philippi very rightly laid stress in the diagnosis of these cases. This area is familiar to pediatrists and is acknowledged evidence of intrathoracic glandular enlargement, mainly, the writer has reason to believe, enlargement of bifurcation glands causing pressure on the right pulmonary artery, and thereby reducing the function and volume of the right lung. This dull area may overstep the normal "oval interspinous dullness" (see Fig. 2) between the first and fifth dorsal spines, so as to stretch out some 6 or 7 cm. on one or both sides and extend down to the sixth or seventh dorsal spine.

*Parasternal dullness* is sometimes present, though less often than paravertebral, and it generally points to enlargement of lateral tracheal and tracheo-bronchial glands. Normally there exists some 2½ cm. (1 inch) of impairment on each side of the sternal border, and this may be increased in these cases to 5 or 6 cm. on one or both sides.

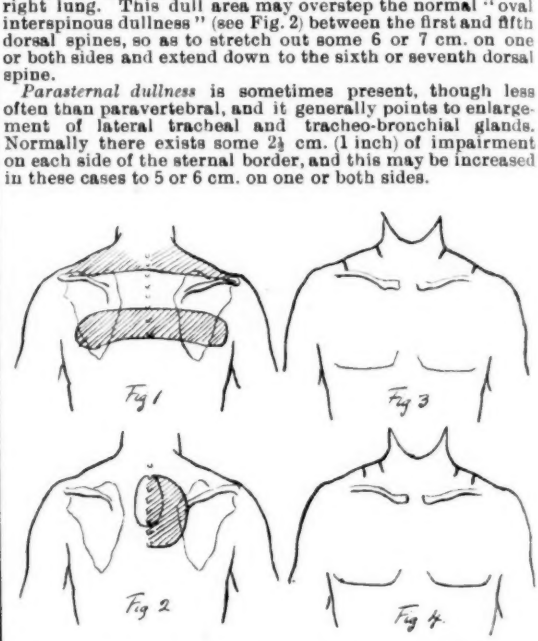


FIG. 1.—Reflex bands of impairment. FIG. 2.—Paravertebral dullness. FIGS. 3 and 4.—"Krönig's isthmus" of apical resonance, normal and reduced.

4. Most important of all as evidence of deep disease we find a *bilateral narrowing of "Krönig's isthmus"* of apical resonance at the top of the shoulder. (See FIGS. 3 and 4.) In the normal chest this "isthmus" measures 4½ to 5 cm. on each side, though in women and undersized men of sedentary occupation it may fall as low as 4 cm. In cases of hilus tuberculosis we find it considerably reduced on both sides, very commonly to 2½ cm. This bilateral narrowing gives us valuable evidence in two directions. Firstly, it is no healthy chest we are examining—though nothing else can be found at the surface we can be quite sure that some central disease, whether of present or recent activity, is present. Secondly, a bilateral narrowing is not characteristic of apical phthisis, save in its later and bilateral stages when abundant other surface signs will be present. In phthisis, as a rule, the retraction of the isthmus is less marked—often only to 3½ cm.—and in early stages is unilateral.

A comparison of the width of the apical resonance in a number of cases taken at random will serve to bring out clearly the importance of this sign in the differential diagnosis of hilus tuberculosis.

| Hilus tuberculosis | | Apical phthisis. | | Chronic bronchitis. | |
|---|---|---|---|---|---|
| Right. | Left. | Right. | Left. | Right. | Left. |
| 2½ cm. | 2½ cm. | 3½ cm. | 6 cm. | 4½ cm. | 4½ cm. |
| 2½ ,, | 2½ ,, | 2½ ,, | 5½ ,, | 4½ ,, | 4½ ,, |
| 3 ,, | 3½ ,, | 5 ,, | 3 ,, | 5½ ,, | 5½ ,, |
| 2 ,, | 2 ,, | 2½ ,, | 4 ,, | 3½ ,, | 3½ ,, |
| 2½ ,, | 2 ,, | 6 ,, | 3 ,, | 4 ,, | 4 ,, |

5. In hilus tuberculosis of adults *tidal movement* at one or both bases may be diminished or may entirely fail. In the absence of extensive lung disease loss of tidal movement usually indicates adherent pleura, and this is especially so where the loss is on one surface only. Pleurisy is a very frequent complication of hilus tuberculosis, but pleural adhesions are by no means a necessary accompaniment.

*Auscultation.*

Of auscultation in all but the last stages of hilus tuberculosis there is little or nothing to be said. As already indicated, the surface will be entirely free of stethoscopic signs, even though extensive disease occupies the deeper parts of the lung. Still more is this the case in those earlier or more chronic cases for whose recognition and detection the writer here offers a plea.

But though no crepitations are to be expected at the surface in such cases, other signs may be incidentally met with in certain cases. Thus, fleeting marginal pleurisies are common, and fine friction, with or without pain, may be discovered at one or other base or axillary region. Fine inspiratory sounds of indeterminate or mixed nature are also often heard at the bases in cases of hilus tuberculosis in the adult, as in children. These may be atelectatic, or may stand for œdema or lymph stasis, or may be mere tissue sounds developed under pressure of the stethoscope—their nature generally remains undecided! If the breath sounds are "blowing" at the right apex, as sometimes happens, this may be due to glandular enlargement, and is not necessarily evidence of pulmonary consolidation.

*Radiographic Appearances.*

Something must be said of the radiographic appearances, and these may be conveniently divided into three types according to the activity of the process.

*Chronic and quiet disease with little or no evidence of activity.*—This represents perhaps the commonest type of case, the evidences of activity being entirely dependent on other factors than the X ray picture. The main point about the radiogram is the abnormal visibility of the whole lung reticulum, which appears thick and strongly shadowed in all its "twigs" right out to the periphery. The main branches appear thickened, often wide and tape-like, or may appear as rings or figures-of-eight, with or without some dilatation of their lumen. The whole picture has a general "fibrous appearance," nodules may be absent and yet the case tuberculous, or there may be a nodular appearance throughout. In many of these chronic cases the radiogram may present so "fibrous" a picture that it is hard to believe any activity can be present. Yet the patient may present symptoms and develop a fresh pleurisy as evidence that the process is not obsolete.

In hilus tuberculosis, of whatever form, it often appears that the diseased area is, roughly, equal on the two sides and often reaches nearly to the periphery; it may present a sharply-marked outer margin, giving a butterfly appearance and strongly suggesting a simultaneous spread out to this point rather than a slow creeping outwards. Indeed, judging from the X ray and post-mortem experience, the writer is convinced that a simultaneous "sowing" of disease over a wide area occurs not infrequently, though the gradual outward spread presumed in the general description of the disease can also be proved to occur, and is perhaps the rule.

*More active disease.*—This may show itself in a more woolly and less sharp-cut appearance of disease which yet remains, to X ray examination, purely "peribronchial." The thickening of the bronchi is more marked both round the root and farther out in the lung, and a nodular or even "budding" appearance may be noticeable. The finer network of the lung is thickened irregularly or nodular shadows of various size and not very sharp outline may be linked up in it.

*Active and acute disease.*—This is sufficiently illustrated by the X ray plate of the case described at the opening of this paper. The strands of the lung network vanish and the pulmonary fields become filled with woolly bronchopneumonic shadows of smaller or larger size, with eventual coalescence and cavity formation.

*Differential Diagnosis.*

And now, having indicated something of the symptoms and physical signs, and of the general characteristics of hilus tuberculosis in the adult, it still remains to emphasise the main points in its differential diagnosis. And first of all it is necessary, in the early cases, to indicate the points which separate *the healthy chest* from that containing a central lung lesion. For those who are careless over their physical signs the healthy chest is merely one that presents equal movement on the two sides, no obvious areas of dullness, and no stethoscopic signs. But the chest of early hilus tuberculosis shares with the normal chest all these negative points; hence these are useless in its diagnosis. Only after Krönig's isthmus has been carefully mapped and measured, paravertebral and parasternal dullness searched for, and, less important, tidal movement at the bases explored, can early hilus tuberculosis be excluded. In particular, it cannot be too strongly insisted that Krönig's apical resonance represents one of the essentials of chest examination, since it supplies practically the only key to the condition of the central area of the lung. True, the X rays will also reveal these central areas, but the information they give is largely clouded by the constant presence of the shadows of obsolete tubercle remaining from the common childhood infection; the question of recency and activity cannot be decided with the X rays save for acute forms of the disease, with which we are not here concerned. The points on which a differential diagnosis must be based may be shortly indicated as follows:—

| — | Normal chest. | Early hilus tuberculosis. |
|---|---|---|
| Reflex bands (Fig. 1). | Absent. | Present. |
| Krönig's isthmus (Figs. 3 and 4). | Of normal size. | Contracted on both sides. |
| Paravertebral dullness (Fig. 2). | Absent. | Often present on right side. |
| Parasternal dullness. | ,, | Present in some cases. |
| Tidal movement. | Of normal amount. | Often absent or reduced on one or both sides. |

Having discovered through the evidences of these signs that the chest under consideration is outside the normal, what proof have we that the malady is of tuberculous causation? Often, it must be confessed, very little in the individual case. For hilus tuberculosis may smoulder for years without any very characteristic symptoms, and tubercle bacilli may be absent from the sputum almost throughout its course. Where there are definite evidences of glandular enlargement, as shown in paravertebral and parasternal dullness, the case presents striking similarity to tuberculosis of childhood, and there exists strong probability of its tuberculous nature. Where, however, the only definite sign is a double narrowing of Krönig's area (and again it must be insisted that a healed childhood infection does not leave this sign behind), we have evidence of a central lung lesion but none of its activity, and still less of its tuberculous causation. We must look elsewhere—to symptoms mainly—for evidence that disease is not arrested or healed, and in doing so we sometimes find tubercle bacilli present and our whole difficulty solved.

Failing this fortunate chance, only an appeal to experience can supply us with means of reaching conclusions at least of high probability. For, apart from the well-recognised predilection of tubercle for the lung root, its almost constant presence as the result of a childhood infection, and its known tendency in this situation to persistent quiet activity and intermittent spread, we shall have clear recollection of patients with identical physical signs who later passed over into the region of proved tuberculosis. (The writer is here presuming that his own experiences are, or may become, common to others.) Our position is little worse than in the diagnosis of apical phthisis in the absence of bacillary sputum, again a matter of probability of a high degree.

"Given apical changes," remarked Turban, "without previous pneumonia, and when inhalation of dust can be excluded, then the diagnosis is almost certain."

And the same might be claimed, perhaps, for central or hilus lung disease. A patient with narrowed apices and suggestive symptoms, but with no history pointing to dust inhalation, may be regarded as probably suffering with active peribronchial tuberculosis; a patient with narrowed apices and no symptoms is probably the victim of arrested disease of similar causation. For, failing this explanation, there must exist a disease, presumably a peribronchitis of chronic course, of whose causation and pathology we are at present entirely unenlightened—a rather improbable proposition in the writer's opinion. Only occasionally, indeed, in these cases do other points fail to give additional support to their presumed tubercular origin—paravertebral dullness in a large proportion of the cases, and not infrequently the occurrence of a "marginal" pleurisy at one or other base.

The differentiation of hilus tuberculosis from *apical phthisis* is, as a rule, simple and straightforward, particularly in its early stages. With the advance of disease the two conditions may become difficult or even impossible to separate. Indeed, it must be admitted that between the two characteristic types intermediate pictures of disease may be observed not clearly conforming to either, or possibly a blending of both. But in spite of this occasional failure of type the differential diagnosis can generally be made, and

it is always worth an attempt on account of the differing course and prognosis in the two conditions. For hilus tuberculosis is nearly always of peribronchial type and extreme chronicity; tending to spread over wide areas, often with greater mechanical than constitutional disturbance; becoming arrested for long periods; showing occasional activity, often of a pleuritic nature, and then again dying down. Smouldering always, and always difficult to quench, but only at long last, and in exceptional cases, breaking into a conflagration of such intensity as to threaten life, and then usually at so advanced a stage that the outlook is obviously hopeless. The broncho-pneumonic case quoted at the beginning of this paper presents only a rare exception to the usual course.

In all particulars of its spread it stands in some contrast to apical phthisis, of which the immediate prognosis is always more serious and uncertain, and which moves forward more rapidly, accompanied by fever and constitutional disturbance, albeit with periods of arrest, towards its ultimate ending in death or cure.

Already, under the heading of the characteristics of hilus tuberculosis, some of the main points of distinction from apical phthisis have been insisted on—its bilateral character from the beginning, its appearance at other points than the apex of the lung, and its spread over a wide area of the chest wall once the surface is reached. In practice the differential points may shortly be tabulated as follows.

| — | Hilus tuberculosis. | Phthisis. |
|---|---|---|
| Inspection. | Nothing characteristic, but any change, such as flat chest or emphysema, will be bilateral. | Flattening or hollowing and lagging of one apex in advanced disease. |
| Percussion. | Perhaps slight "contrast" impairment on one side, generally the right. | Decided impairment at one apex. |
| | Parasternal or paravertebral impairment, or both. | Neither. |
| | Bilateral narrowing of Krönig's isthmus. (Fig. 4) | Unilateral narrowing of less extent. |
| Palpation. | Movement equal or nearly so on the two sides. | Unilateral deficiencies of movement. |
| Auscultation. | No stethoscopic signs at earlier stages at most fleeting pleurisies or transient basal crepitations; then granular breath sounds over a wide area, changing to crepitations. Wide areas involved, often the middle or base of the lung. Often the whole of one lung involved before signs appear on opposite side. | Fairly early stethoscopic signs at one apex, soon crepitations here, later at opposite apex. |

So much for the differential diagnosis between these two forms of pulmonary tuberculosis, or rather between fairly typical cases of each. That many borderland cases occur whose classification is doubtful the writer has already indicated, but the classical case of hilus tuberculosis at a characteristic stage clearly belongs to a type by itself. Where an element of doubt in their differentiation must sometimes exist is in the eventual progress of certain early examples of disease—whether these must necessarily be regarded as on the way to become hilus tuberculosis as we eventually see it, or whether their future advance might be on the lines of an apical phthisis. This is a matter on which there can exist no great certainty at present. For these earliest examples might possibly represent, in some cases at least, a "sub-tuberculous" stage from which both phthisis and hilus tuberculosis may later emerge, and the writer has not shut his eyes to this possibility. But for one of these early cases, with double narrowing of apices, to progress towards apical phthisis it would be necessary for this apical contraction to open out. This the writer has never known to occur under observation, unless perhaps partially in a single case. As a rule, the apices tend to become narrower with time, whether with a spread of disease in a progressive case, or with fibrotic changes where repair is taking place. More tempting is it to assume a true etiological distinction between the two types of disease, hilus tuberculosis being regarded, as the writer has frankly presumed it at an earlier stage of this paper, as a reawakening of the arrested lesions of childhood, and phthisis as a reinfection from without. If this were a true picture of the case, then there could of necessity be no early stage common to both diseases.

*Variations in Type of Case.*

And now, at the close of this paper, it is necessary to mention the existence of certain variations from the common type of hilus tuberculosis outlined above.

1. *Hilus tuberculosis associated with bronchitis.*—In many cases of hilus tuberculosis of chronic "peribronchial" type there is a tendency to attacks of bronchial catarrh, and the recurring cough and sputum are often, in all probability, of this origin. Certain cases may, indeed, present all the symptoms and many of the signs of chronic bronchitis with emphysema, and often with asthmatic attacks.

As a rule, there are certain points which direct attention in such cases to the underlying tuberculous disease. The history is likely to be of short duration, and wasting will generally be a prominent symptom. Often one or more brothers and sisters of the patient are pronouncedly tuberculous. The pulmonary signs may be in most respects typical of chronic bronchitis, though often with a bias of signs against one side of the chest. But it is to a narrowing of Krönig's isthmus that we must look for more definite evidence of central disease. In chronic bronchitis it might well be expected that Krönig's isthmus would commonly, owing to the presence of emphysema, show a more or less striking enlargement. In some cases, truly, the apex may be as wide as 5½ cm. or even 6 cm., or it may maintain the normal 5 cm.; but much more frequently the raising of the shoulder girdle, and possibly also the development of some amount of peribronchial fibrosis, tend to reduce the isthmus to a figure rather below the normal, often to 4½ cm. or 4 cm. In some cases where the isthmus is diminished to 3½ cm. doubt will be felt whether the condition belongs to the category of simple bronchitis or not. Where the reduction is to 3 cm. or 2½ cm. there is decided evidence of central lung disease, and in the absence of a history of exposure to dust diseases this will probably be hilus tuberculosis. The possibility of tubercle masking under the guise of asthma or chronic bronchitis must always be borne in mind.

2. *Hilus tuberculosis, with tuberculosis of manifest glands.*—These are cases in which gross enlargement of the cervical and axillary glands occurs, and sometimes of other groups. The lung condition is usually a secondary incident, and the chest picture is that of enlarged chest glands. The writer has had five such cases under his care, and in two of these there was associated enlargement of the thyroid gland. It is to this class of case that Philippi called particular attention, insisting above all on the characteristic parasternal and paravertebral dullness.

3. *Hilus tuberculosis of broncho-pneumonic type.*—This has already received illustration at the outset of this paper. Suffice it to remark once again that this represents but a rare variety of the disease. Hilus tuberculosis in its characteristic type runs a chronic and intermittent course, and when the proper means are employed for its recognition it will be found to be of widespread distribution, and even to constitute the most prevalent form of pulmonary tuberculosis in the adult as well as in the child.

Queen Anne-street, W.

# THE SUBSTITUTION OF AIR FOR OXYGEN IN ANÆSTHESIA

## WITH HEWITT'S GAS AND OXYGEN APPARATUS.

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SOME months ago, during a temporary failure in the supply of oxygen for anæsthetic purposes, it occurred to me to try ordinary air in place of oxygen with the Hewitt's apparatus in general use here. This proved so satisfactory that the use of gas and oxygen has been entirely discontinued at this hospital, and some hundreds of administrations of duration varying from a few minutes to a full hour have been given by the air method.

The air is supplied by a foot-bellows such as that made by Messrs. Fletcher, Russell and Co., of Warrington, which is attached to the oxygen tube of the apparatus, and the two bags are easily kept full by the same foot.

The Hewitt apparatus is provided with a series of ten holes for the graduated introduction of oxygen to the inhaler, and by means of a coarse adjustment representing 10 and 20 holes the number used can be varied from 1 to 30. In working with air it is, of course, necessary to use a freer entry than is the case with oxygen. The method employed is as follows:—

A perforated metal "cotton-reel" gag is placed between the teeth, and a square of Gamgee tissue with a central cruciform hole intervenes between the face and the mask. The gas is set slowly leaking from the cylinder into its bag, so as to keep it just fully distended, while the air-bag is kept in the same condition by the foot-bellows. About seven "holes" are opened for air entry at the beginning of the administration, and this number is rapidly increased by means of the coarse adjustment to nearly the full 30 as soon as the breathing becomes deep. This is in some cases

sufficient to avoid all cyanosis, stertor, or jactitation, during the induction period, but many patients also require an occasional breath of pure air at this stage. The pupil dilates somewhat towards the end of the induction period, but soon returns to a mid position and remains so throughout the administration. The colour is, on the average, slightly more dusky than when oxygen is used, but the difference is small. The induction takes distinctly longer than with oxygen, and the surgeon generally wishes to begin too soon.

Breathing soon becomes regular and moderately deep, and the air entry can then be reduced. There is much variation between different individuals in the amount of air required to maintain complete quiet anæsthesia. The average amount is 15 to 20 "holes." Some do best with fewer than ten, while others require nearly the full 30 "holes," and others, again, an occasional breath of pure air in addition. Towards the end of a long administration more air and less gas is needed, especially with greatly debilitated subjects

No ill-effects have been noticed during or after administration, and I have not come across any instance of post-anæsthetic vomiting. The limitations of this method are much the same as those of gas and oxygen, though it is undoubtedly easier to produce and maintain a satisfactory degree of muscular relaxation when using air. It is very easy to administer in cases where vitality has been reduced by shock, hæmorrhage, or sepsis, while strong, full-blooded men are difficult subjects.

I have not so far used the method for intra-abdominal operations, and for intra-thoracic I prefer oxygen bubbled through chloroform and warmed by the Shipway apparatus; but for amputations and most general surgical procedures it is well adapted unless postural requirements contra-indicate by rendering it difficult to maintain the face-piece in position. This method has advantages over gas and oxygen from the points of view of economy and portability of apparatus.

## STAMMERING IN THE WAR PSYCHO-NEUROSES.

BY E. PRIDEAUX, M.R.C.S., L.R.C.P. LOND.,
TEMP. CAPTAIN, R.A.M.C., EWELL WAR HOSPITAL.

STAMMERING is a common symptom of the war psycho-neuroses, and appears to be one of the most difficult symptoms to treat. The original theories on stammering pointed to some physical cause as the basis of the condition and regarded as responsible factors some weakness of the organs of articulation, or tongue, or incorrect respiration with spasms of the diaphragm, &c., perhaps connected in some way with the blood-supply of the brain. Most of the treatment at the present day has been based on these old theories and consists of various forms of complicated speech-drill and regular breathing exercises. The partially successful results, obtained by these methods, have convinced both the instructors themselves, and others, of the apparent truth of these theories, and there seems some danger that we should lose sight of the real nature of the affection and the process underlying the mechanism of its cure.

### *The Part Played by Suggestion.*

The history of the treatment of stammering, which includes the use of drugs, both internally and externally, surgical operations such as that of Dieffenbach by cutting the root of the tongue, or of Braid, by removing the tonsils and uvula, various forms of electricity and hypnosis, all of which have been successful in their day, must make one suspect that the present various methods of speech-drill and breathing exercises, owe their efficacy to the same mechanism—namely, "suggestion."

My own experience in the treatment of war stammerers has convinced me that this is the case. I have removed stammers by direct verbal suggestion, both in the waking and hypnotic states, and by indirect suggestion by insinuation, with the help of electricity, or different forms of exercises and speech-drill, the effects of which have produced physical reactions directly opposed to each other. I have also used Luys' old method of so-called "transfer," with the help of a hypnotised subject. Some of the patients treated by these methods had been attending stammering classes for five months, and gave up their stammer in as many minutes.

Just as a stammer can be made to disappear by suggestion so it can be reproduced by suggestion in certain subjects. A few of my cases give a history of beginning to stammer only when being brought into contact with other stammerers. This is the process named by Freud "identification." They stammer because they have had the same experience as the others, and do so by auto-suggestion. I have never known a patient who is undergoing treatment and understands his condition get a stammer in this way.

### *Stammering as a Symptom of Hysteria.*

Stammering, then, must be considered as a symptom only of hysteria, for it even conforms to Babinski's limited definition[1] that "hysteria is a pathological state manifested by disorders, which it is possible to reproduce exactly by suggestion in certain subjects, and can be made to disappear by the influence of persuasion (counter-suggestion) alone."

It is also a very good example of Janet's[2] "disposition to equivalences" in hysteria, the tendency of one apparently quite different symptom taking the place of another. Yealland's[3] case of an officer with monoplegia of the lower limb who returned two days after his leg had been cured, with a stammer, is an instance of this disposition. An interesting case of mine showed this very markedly. The patient had been a stammerer since childhood, and at the age of 21 developed a monoplegia of the right arm after an accident. Two months elapsed before he came to me for treatment, and during this time and on admission he had no trace of stammer. After recovering the use of his arm the stammer returned, and was removed by further mental analysis.

Stammering following removal of mutism and aphonia is also an example of the disposition to equivalences, and does not occur after modern psycho-therapeutic methods. In the same way other symptoms may appear as the result of removing a stammer, when the underlying psychical cause has not been discovered and explained to the patient.

The psychical nature of the condition is also shown by the following facts. In my experience stammerers who have developed their stammer after having once learnt to talk normally in childhood, do not stammer in their sleep, or when standing on their heads; they can sing and whisper without stammering, and stammer less, or not at all, when talking to inferiors, or reading aloud to themselves. On the other hand, they stammer more when in a state of emotion, and stammer particularly over words and incidences which are associated with some past emotional experience of a painful nature.

These facts have led me to believe that the physical theories as to the origin of stammering, such as hyperæmia of the brain,[4] muscle spasms, and weakness of the organs of articulation, are quite untenable, and that the present treatment, by physical methods founded on these theories, is wrong in principle, and often does harm, even when it is used by those who recognise the psychical nature of the condition.

### *Treatment.*

In the war psycho-neuroses we meet with two distinct classes of stammer:—

1. That in which the stammer is more or less constant, when the patient does not really concern himself about his stammer; it resembles in this respect mutism, aphonia, monoplegia, &c., and is the true hysterical type, belonging to Freud's "conversion hysteria" class.

2. That in which the patient is intensely anxious about his stammer, and in which the dread of stammering is sufficient to keep up the condition. It may only occur in a state of emotion, and it is more marked in relation to words and incidents associated with past emotional experiences. This is the "psychasthenic" type, and belongs to Freud's "anxiety hysteria" class.

The treatment of these two classes is fundamentally the same—viz., finding out the underlying psychical cause for the origin of the stammer, which will be found to be connected with some past emotional experience of a painful nature, giving rise to mental conflict and undergoing repression.

In the true hysterical type I think it is better to remove the stammer first by some form of persuasion or suggestion, using the simplest method possible, so that the patient realises that he himself is responsible for the cure, as emphasised recently by Dr. T. A. Ross.[5] Physical exercises for this type may be used as a means of suggestion and do no harm,

provided that the process is carried through in one sitting, but they are not necessary. After this a short mental analysis and explanation are required to complete the cure. I used to rely on some form of suggestion only, but I soon found that permanent cure was uncertain. The analysis must discover the moment when the stammer or its equivalent symptom first appeared and the circumstances which led up to it; all the unpleasant experiences must be fully brought back to memory, so as to produce complete abreaction, and the patient must be encouraged to talk freely about them, for "an emotion, which is judged, and which has become an integral part of acquired consciousness, is by this very fact no longer an emotion."[6]

The treatment of the psychasthenic stammer is more difficult, and more prolonged mental analysis is generally necessary. In this class I think that physical exercises definitely do harm. They attract the patient's attention still more to his speech, make him painfully conscious of his stammer, and increase his dread, thereby increasing the repression of his past experiences. I find that it is better to make no attempt to treat the psychasthenic stammer as such. I explain to the patient why he stammers, and reassure him as to its removal. I tell him that the stammer is only an expression of the condition of his mind, just as weeping is, but that in the former he is unconscious of the cause, and that when we have discovered the cause the stammer will disappear. When this has been done, and the patient is able to talk about his experiences without emotion the stammer gradually disappears.

My experience of war stammers has convinced me that stammering in civil life must be due to similar causes, that habit does not play such an important part as is supposed, and that the best method of treatment is by mental analysis.

*References.*—1. Hysteria, Babinski and Froment. 2. Major Symptoms of Hysteria, Janet. 3. Hysterical Disorders of Warfare. 4. Journal of Royal Army Medical Corps, August, 1917, C. MacMahon. 5. THE LANCET, 1918, ii., 516. 6. Psychotherapy, Dejerine and Gauckler.

## A SIMPLE METHOD OF STAINING THE DIPHTHERIA BACILLUS BY A TOLUIDINE BLUE ACETIC ACID MIXTURE.

BY P. L. SUTHERLAND, M.B., CH.B., D.SC. GLASG., BACTERIOLOGIST, WEST RIDING COUNTY COUNCIL.

NUMEROUS methods of staining have been devised to differentiate the *Bacillus diphtheriæ* from allied organisms occurring in cultures from throat swabs. Of these methods that of Neisser is probably the most extensively employed, as experience has shown it to be reliable, and it clearly brings out the characteristic polar bodies of the bacillus. Neisser's procedure has, however, the disadvantage that the counter-staining, washing, and drying of the films occupies a considerable amount of time, a matter which is of importance in public health laboratories where large numbers of cultures are examined daily. For routine examinations the use of methylene blue applied in the manner recommended by Cobbett and Phillips (1897) has the advantage in this respect. In this method the smear is made on a cover-glass and is allowed to dry; a drop of dilute Löffler's methylene blue (1 in 5) is then placed on a slide and over this the cover-class is placed film side down. The excess of stain is removed by pressing the preparation cover-glass downwards on a layer of filter paper and the specimen is ready for examination. The staining is inferior to that obtained by Neisser's method, as the *Bacillus diphtheriæ* has very frequently a segmented appearance and the polar bodies are not clearly shown, with the result that it is often difficult to distinguish it from the longer forms of Hofmann's bacillus. Later, Cobbett (1901) showed that by running a few drops of dilute acetic acid (5 per cent.) under the cover-glass the bodies of the bacilli become decolourised, and the polar granules tend to become more clearly defined.

After a considerable experience of the use of Cobbett's method it was thought that it might be possible to prepare a stain which, applied in a similar manner, would give results more closely resembling those obtained by Neisser's stain. Numerous stains and combinations of stains were tried, and it was found that toluidine blue, owing to its polychromatic properties, gave the most satisfactory results. The use of toluidine blue for the staining of *Bacillus diphtheriæ* has already been recommended by Pugh (1905) and by Ponder (1912). Pugh's formula was tried, but was found to contain too much acetic acid.

The stain, the composition of which is given below, was finally adopted in the Public Health Laboratory, Wakefield, in 1910, and the formula was published in a short note in the bacteriological section of the annual report of the county medical officer for the West Riding of Yorkshire for that year. The method has now been in use for a period of eight years, during which time the annual average number of specimens examined has been 7000; it may, therefore, be of interest to those engaged in similar work to describe the method.

The staining solution, which keeps well, has the following composition: toluidine blue, 0·1 g.; glacial acetic acid, 0·5 c.cm.; distilled water, 100 c.cm.

The smears are made on slides and are fixed with heat in the usual way. When large numbers of cultures have to be examined it is most convenient to make the smears in a series of 10 or 12 at one time. A drop of the stain is placed on each film and a cover-glass is then placed over the preparation. The excess of stain is removed by blotting each slide between two layers of blotting-paper immediately before being examined. The first slide is ready for examination about one minute after the stain is applied, and the others are taken in rotation. The best results are obtained by using strong artificial light.

When stained in this way the polar granules of the *Bacillus diphtheriæ* are of a deep reddish-purple, while the bodies of the bacilli appear faintly blue. Most of the organisms found in diphtheria swabs, including Hofmann's bacillus, are more faintly stained, so that the *Bacillus diphtheriæ* is readily detected when present only in small numbers.

The stain may also be used in a similar manner for demonstrating the bacillus in smears made direct from the swabs, in which case the film should be allowed to stand in the stain for from two to three minutes before removing the excess.

*References.*—Cobbett and Phillips (1897): The Pseudo-diphtheria Bacillus, Journal of Pathology and Bacteriology, vol. iv., p. 193. Cobbett (1901): A Note on Neisser's Test for Diphtheria Bacilli, THE LANCET, 1901, vol. ii., p. 1405. Pugh (1905): A Note on the Examination of Cultures and Smears from the Throat and the Nose, THE LANCET, 1905, vol. ii., p. 80. Sutherland (1910): Annual Report of County Medical Officer, West Riding of Yorkshire, 1910, p. 21. Ponder (1912): The Examination of Diphtheria Specimens, A New Technique in Staining with Toluidine Blue, THE LANCET, 1912, vol. ii., p. 22.

*Corrigendum.*—At the head of the last column of the table illustrating Dr. I. Harris's note on the Inverted "T" in the First Lead of the Cardiogram (THE LANCET, Feb. 1st, p. 168) *? T.* should read *? P. T* was inverted in all the cases. We regret the error, which was not the author's.

LITERARY INTELLIGENCE.—The University of London Press announce the issue of five further volumes in their Military Medical Manual Series as follows: Disabilities of the Locomotor Apparatus, by Aug. Broca, edited by Sir Robert Jones; Electro-Diagnosis of War, by A. Zimmern and P. Perol, edited by Dr. E. P. Cumberbatch; Wounds of the Pleura and Lung, by R. Grégoire, edited by Lieutenant-Colonel C. H. Fagge; Mental Disorders of War, by Jean Lépine, edited by Dr. Charles Mercier; Commotions and Emotions of War, by A. Leri, edited by Sir John Collie.

A DOCTOR'S WELCOME IN UGANDA.—Medicine earns its due meed of recognition in Uganda, where, at Kampala, Dr. Albert Ruskin Cook, superintendent of the hospital, had a great reception from the European, native, and Indian communities on his recent return from England, where he had received a decoration of the Order of the British Empire. At the official residence of the Kabaka there was a large gathering of guests assembled to present an address of welcome, including the Bishop of Uganda, Mr. Pellew-Wright, the Deputy Commissioner, and Sir Apolo Kagwa, ex-Regent and present Prime Minister. The address was read by the Lukiko's secretary, Musa Musoke. The Indian community erected a handsome arch on the public road bearing the inscription, "Welcome to Dr. and Mrs. Cook." A necklace of flowers was presented by Mr. M. M. Khandwala, president of the Indian Association, who also read an address of welcome. The day ended with the cutting the brides' cakes by Dr. Cook and his wife for the double wedding in Namirembe Church, when the twin daughters of Sir Apolo Kagwa were married to the sons of important chiefs.

# Medical Societies.

## MEDICAL SOCIETY OF LONDON.

*Gonorrhœa of the Genito-urinary Passages.*

A MEETING of this society was held on Jan. 27th, Dr. A. F. VOELCKER (Major, R.A.M.C.T.), the President, being in the chair, when Brevet Colonel L. W. HARRISON opened a discussion on Gonorrhœa of the Genito-urinary Passages.

Colonel HARRISON said: I confess that since I accepted the honour of your invitation to open a discussion on gonorrhœa I have looked forward to the event with considerable misgiving. For I have no hope of being myself able to say anything which is new and instructive to the members of this learned society, and can only trust that I may induce others to discuss certain details connected with the treatment of acute gonorrhœa which may be interesting and profitable to us all. The points which I propose to raise are connected with the abortive treatment of gonorrhœa, some details of the technique of irrigation, and the attack on the gonococcus through the blood stream.

*Abortive Treatment of Gonorrhœa.*

In other places I have frequently said that if the general public only realised how easy it is to abort gonorrhœa when treatment commences on the very first day, and yet how very difficult it is to cure it when it has been given a start of even two days, they would apply for advice on the first appearance of any abnormality, and gonorrhœa would cease to be the scourge it is. As you know, the gonococcus is an extremely easy germ to kill with antiseptics, provided that those antiseptics can only reach it, and had it not been for its faculty of penetrating to the deeper layers of the mucosa and into the follicles and crypts opening on to the mucosa, the gonococcus would long ago have ceased to exist.

We can reckon with a fair amount of certainty on all the gonococci within an urethra being accessible to antiseptics *only on the first day of the disease*, so that promptitude of action is of the very first importance. Unfortunately, in the very great majority of cases the patient will go on hoping for the best until the discharge has become frankly purulent, and by that time the gonococcus is well out of reach. Our colleagues of the Overseas Medical Services have been pioneers in a widespread endeavour to break down this fatuous optimism of patients by diligent propaganda and have met with a considerable amount of success. I would quote in this connexion Lieutenant-Colonel Raffan, of the A.A.M.C., who has informed me that in a period of six months the 18 abortive treatment centres which the Australian authorities established in this country were successful in aborting over 2600 cases of gonorrhœa. He agrees with Ballenger in expecting 90 per cent. of successes when the treatment commences on the very first day, success meaning complete cure in a week or ten days.

Encouraged by the success of the Colonial medical authorities, I obtained consent in the latter end of last year to the establishment of an abortive treatment centre for Imperial troops in the London district. We have not met with such a high percentage of success as have the Australians, mainly, I think, because practically all the cases on which we have attempted the abortive treatment have been in the second or even third day of the disease. From August last to the end of 1918, out of 738 cases of gonorrhœa which reported at the centre, 129 were considered worth the attempt at abortion. In 69 the attempt failed, and the patients had to be admitted to hospital; in 10 cases the patient failed for one reason or another to complete the period of observation after completion of the treatment, so that it is uncertain whether the attempt was successful or not, and in 50 cases the disease was aborted in a week or ten days. I may mention that in all cases the diagnosis was verified by microscopical examination of the urethral secretion and the cure by examination of the patient a week after cessation of all treatment. As I mentioned, I think that our success would have been considerably greater if our cases could only have started treatment a day earlier, and I have seen sufficient of the abortive treatment of gonorrhœa to urge on you the importance of spreading a knowledge of its possibilities amongst the general public.

*Technique.*

We have tried many of the plans which have been recommended for the abortion of gonorrhœa, including iodoform bougies, large irrigations with permanganate of potassium, and Ballenger's sealed-in treatment, in which about 20 minims of 5 per cent. argyrol are sealed into the urethra for six hours. The Ballenger method proved fairly successful, but our cases were mostly too far advanced for its application, and our present method is as follows:—

1. The parts are thoroughly disinfected with 1/2000 perchloride of mercury solution.

2. The urethra is irrigated with 1/4000 permanganate of potassium solution, using a two-way nozzle and about two pints of solution.

3. Ten per cent. argyrol or 5 per cent. protosil solution is injected into the urethra and retained for 20 minutes.

This is repeated twice daily for 3–4 days and then the silver compound is omitted, the permanganate irrigation being continued for another 4–6 days. Films of the urethral secretion are examined every other day for gonococci to judge the prospects of success. When the discharge has completely ceased or has become extremely scanty and no gonococci can be found in it after an honest search, the treatment is omitted for a day, and if by the tenth day the urethra seems to be perfectly quiet all treatment is stopped and the patient told to report again in a week for confirmation of the cure. Sometimes he comes back in a few days with a return of the discharge and is then admitted to hospital as a failure. The after progress of patients who have been so admitted has been quite as good as, if not better than, that of patients who were admitted at once, so that the method of abortive treatment which we have adopted does not, like some of the drastic measures which have been advocated, prejudice the cure when it fails in its immediate object. Perhaps a longer period of probation would be a better index of success, but this would involve considerable administrative difficulties, and after all it is unlikely that live gonococci would remain a week in a fresh urethra without setting up acute inflammation.

*Some Details of Technique of Local Treatment.*

After the disease has passed the stage when abortive treatment is practicable there is some difference of opinion as to whether it would not be better to rely only on general measures rather than to supplement general measures by treatment applied to the urethra. I am bound to say that it would be a great advantage if we could dispense with local treatment, but I have treated parallel series of cases with and without local treatment, and there is no question that those on local treatment cleared up very much quicker. I would also refer you to a paper by Donald and Davidson, who treated two series of 200 cases each, one by local and general treatment and the other by general treatment only. Their experience agrees with my own and that of most genito-urinary surgeons, that in the present state of our knowledge we cannot profitably dispense with local treatment.

There are a few details connected with the local treatment which may be worth discussion, and I should like to deal first with

*The Prevention of Secondary Infection.*

If one takes the trouble to examine the secretion frequently throughout an attack of gonorrhœa, or, more certainly, if one takes cultures, it is depressing to find how quickly secondary organisms make their appearance, particularly staphylococci and diphtheroids, which are normal inhabitants of the preputial sac. No doubt these organisms are largely saprophytic, but I do not think they are as harmless in an inflamed urethra as they may be in the preputial sac. I have seen numbers of cases of chronic urethritis where diphtheroids and staphylococci seemed to be the only organisms present, and there were good grounds for believing that one or both were responsible for keeping up the irritation. Occasionally, too, one comes across a case where a prostatic abscess has formed years after an attack of gonorrhœa and the pus is packed with staphylococci, and we have good evidence that diphtheroids can set up a particularly intractable form of ulceration of the penis and inguinal region.

In dealing with large numbers of patients, as we have to do in the Army, I have found it particularly difficult to exclude this secondary infection. Circumstances work rather strongly against one's efforts. Those responsible

for the constructional details of irrigation rooms have tended to act on the principle that the arrangements for such a sloppy process as irrigation could most suitably be housed in a wash-house type of place, and once an irrigation room has been built it is pretty difficult to get it altered. Such surroundings must act on the patient's mind and tend to increase his normal carelessness over such details as disinfection of the glans prior to irrigation. Most patients are content to allow a little of the irrigating fluid to flow over the glans prior to insertion of the nozzle, but I have never been able to see the value of a preliminary sluicing with weak permanganate of potassium solution and have tried to institute a more effective system of preliminary disinfection. In the beginning of the war I provided spirit lotion with which to swab the glans thoroughly. Later perchloride or biniodide of mercury lotion was provided, but I am afraid that even in my own hospital there is a great amount of carelessness over this preliminary rite, and unless one, so to speak, makes a drill of it, it is apt not to be carried out. I have brought up the point because the great majority of gonorrhœa patients will have to be treated in public institutions where they will have to irrigate themselves, and unless they are drilled into a habit of preliminary disinfection secondary infection of the urethra is sure to be common. Also it is fairly certain that subsidiary irrigation centres will be established, and it would be well to insist on their internal arrangements approaching the operating theatre rather than the washhouse standard.

*Nature and Strength of the Irrigating Solution.*

The nature of the irrigating solution and its strength are matters over which there is much divergence of opinion. Before the war I myself experimented with many different compounds, and I have since had the privilege of seeing very many more tried by different medical officers, never having interfered with anyone who wished to try a new remedy, provided that he did not propose something which was obviously dangerous and that he undertook to proceed carefully at first. Amongst others I have seen filtered sea-water, hypertonic saline, eusol, chloramine, and almost the whole range of silver salts, but, almost without exception, medical officers have settled on either one of the flavine compounds or permanganate of potassium, with a weak solution of a silver compound for a variant. At Rochester Row we have tried acri- pro- and homo-flavine in different strengths varying from 1/500 to 1/5000 and have supplemented it with an ointment kindly provided by Dr. Browning with a view to keeping up the antiseptic effect. The stronger solutions seem to have been too irritating and most medical officers who are using it now employ a strength of 1/5000, though Davis claims the best results from injection of 1/1000 acriflavine. Our results with the flavine compounds have been very similar to those we have obtained with permanganate of potassium, but we are inclined to think that the permanganate are rather better. Permanganate of potassium solution may be said to be almost the routine irrigating fluid in Army hospitals, not because there is any order about it, but because medical officers have themselves found it to be the most reliable application we have for average cases. The strength of the permanganate of potassium is a matter over which there are differences of opinion. Some prefer to commence with about 1/4000 and increase to as strong a concentration as 1/1000, while others commence with 1/8000 and do not exceed 1/4000 in the later stages.

*Advocacy of Weak Solutions.*

Personally, I believe in the weaker solutions at first, though I know that the stronger solutions may stop the purulent discharge quicker by their astringent effect. After all, the purulent discharge represents the effort of Nature to cast the gonococcus out of the deeper tissues and from the follicles and crypts which open on the mucosa, and in the acute stages of gonorrhœa one should do nothing which will interfere with drainage. My view is that stronger solutions of permanganate and all definitely astringent solutions when used in the acute stages of gonorrhœa *do* interfere with drainage, and by doing so promote the formation of peri-urethral infiltrates.

Some time ago, on the strength of Captain Thomson's discovery that gonococci are very soluble in alkali, I suggested a trial of alkaline irrigating fluids. I thought that they might prove more soothing to the mucosa, more destructive of gonococci, and, by their solvent effect, assist drainage. At first a sufficient amount of sodium carbonate was added to the permanganate solution, immediately before use, to make a 0·75 per cent. solution of the alkali, but this was found to be too strong, and we reverted to a ½ per cent. Dr. Stoker, at the Rochester Row Hospital, has adopted the alkaline irrigation as a routine. He finds that it is more soothing, and there is some evidence that it promotes drainage better in the comparative absence of peri-urethral infiltrates.

*Anterior* versus *Anterior and Posterior Irrigation in Anterior Urethritis.*

Genito-urinary surgeons are divided in opinion as to whether in purely anterior urethritis one should confine one's irrigation to the anterior urethra or, after washing the anterior urethra, allow the solution to enter and be ejected from the bladder. It is urged against irrigation into the bladder that the posterior urethra may become infected unnecessarily, and that such complications as epididymitis are much more likely to occur. I should like to advance some arguments in favour of irrigation into the bladder in all cases, whether purely anterior or not. First, it is well known that in a high proportion of cases the posterior urethra becomes infected without any local interference whatever, and posterior infection is not unknown under purely anterior treatment.

Also it is impossible to detect the moment when the infection is implanted on the posterior urethra. Yet it is granted by all that the surest method of preventing infection of the urethra is to wash away the infection as soon after its implantation as possible. I think that on these grounds alone, with the chance of the infection passing to the posterior urethra always present, one should keep it well washed from the first. Then it will be admitted that our object in irrigation is to wash away the irritating discharges and promote drainage from the deeper tissues, follicles and crypts opening on the urethra. I should like for a moment to consider which method is the more likely to effect this purpose. With anterior irrigation the urethra is distended as far as the compressor urethræ, and, when the nozzle is removed, the irrigating fluid is forced out of the urethra merely by the collapsing walls of the urethra. It slops out, in fact, and its effect in removing secretion which may be blocking the mouths of crypts and follicles must be very slight. Then consider the effect when the sphincter is *persuaded* to open and the fluid allowed to enter the bladder. After some ounces have collected in the bladder the nozzle is removed and the patient forcibly ejects the fluid. I think it must be granted that the cleansing effect must be greater; the mere rush of fluid past the mouths of the follicles in this direction must tend mechanically to remove the plugs from them and assist their drainage.

Regarding the risk of epididymitis, there are so many causes of epididymitis that it would be difficult to prove that posterior irrigation was a prominent one. The general incidence of epididymitis in gonorrhœa has been estimated by various authors at anything from 10 to 25 per cent. The experience of military hospitals is that the highest percentage occurs before admission to hospital—i.e., for the most part before any local treatment has been applied. For instance, out of 9797 cases admitted to one hospital which received patients direct from the front 11·7 per cent. arrived with epididymitis, while out of 1000 admissions to my own hospital 14·4 per cent. were suffering from epididymitis on admission.

After admission to hospital the rate varies with different hospitals, and I strongly suspect it has more to do with the amount of work the patients have to do than any other factor. In the hospital which I have just mentioned, where fatigues at one time were very heavy and have since become moderate, the rate after admission of those cases which arrived with no epididymitis has been 6 per cent.; in another hospital where there is a football ground the rate is 8 per cent.; while at Rochester Row, where the patients lead a very quiet life from the point of view of physical exercise an analysis of 268 consecutive cases admitted last year without epididymitis showed that 4, or 1·4 per cent., developed epididymitis while under treatment, and the rate for 1000 cases of 1917 and 1918 has been 2·1 per cent. I admit that irrigation can cause epididymitis, but it is wrongly conducted irrigation, especially irrigation at too high a pressure, but in most cases one can usually find another cause in too hard work, too early prostatic massage, or too early instrumentation.

I believe, then, that the best instrument with which to irrigate the urethra is the bladder, provided that certain conditions are fulfilled. Thus, the anterior urethra should be washed first as well as it is possible to do so with an anterior irrigation and then the sphincter must be *persuaded* to open by a combination of trickery and pressure of irrigating fluid. But the less pressure the better, and with ordinary irrigating tubing and Janet nozzle I prefer the vessel to be 4 rather than 5 feet above the penis.

*The Attack on the Gonococcus Through the Blood Stream.*

I think that most surgeons who have treated gonorrhœa to any extent must have felt keenly the limitations of local treatment. Until the gonococcus has been cast out of the deeper tissues by natural agencies we have no means of attacking it by local applications. Too often Nature fails to complete her task and we are left with residua of infection which require careful individual treatment to eradicate. Many remedies have been devised to penetrate the mucosa and destroy the gonococcus, but none have yet succeeded, and everyone will admit that if a remedy could be found which, circulating in the blood stream, would directly or indirectly bring about the destruction of the gonococcus gonorrhœa would be a much more satisfactory disease to treat than it is at present. My colleagues and I have experimented with a large variety of compounds, but have so far not found any chemical agent which is a specific for gonorrhœa *in the sense of bringing about destruction of gonococci*. At one time a very large number of patients under my control were treated with intramuscular injections of mercurial compounds, especially succinimide of mercury, and at first it seemed as if a solution of the difficulty might be found in a mercurial compound. Very frequently the first injection of the mercurial compound was followed by an almost miraculous disappearance of the discharge, and very many cases seemed to clear up very rapidly indeed. On the other hand, relapses were much more frequent than under ordinary treatment and cases which did not clear up quickly seemed to drag on with a chronic gleet much longer than those treated by ordinary methods. Altogether, when the account of about 7000 cases was made up I found we had gained nothing. I should not have pursued this will-o'-the-wisp so long had it not been for the fact that of all the mercurial compounds which I tried the succinimide and camphorimide had the greatest effect and some makes of succinimide of mercury worked better than others, all of which led me to think that by patient research we might arrive at the right combination eventually. I am inclined now to think that the mercurial compounds reduced the discharge by interfering with the reactive power of the tissues, bludgeoning them so to speak. This would account for the slowness of recovery of those cases which failed to clear up at once, though I admit that it does not account for those cases which undoubtedly did clear up in marvellously quick time.

*Vaccine Treatment.*

Failing a drug or a chemical compound we are left with a more natural method of ousting the gonococcus—viz., increasing the anti-gonococcal power of the patient's tissues by vaccines. Treatment of gonorrhœa by vaccines has appealed to me since in the early days of my closer acquaintanceship with gonococcal infections I witnessed the almost miraculous effect of vaccines I had prepared on cases of gonococcal arthritis. I admit that, in metastatic complications of gonorrhœa, one can obtain excellent results from the injection of a variety of foreign substances into the body, as I shall mention in a moment, but I am convinced that these earlier results of vaccine treatment were not of the same type, and I can attribute them only to the specific effect of the vaccine in increasing the antibody content of the patient's blood. My experience of the vaccine treatment of gonococcal infections has been mixed. For the most part it has been an experience of long periods when one could legitimately doubt whether they did any good at all unless one compared parallel series of cases, vaccine and non-vaccine treated, with one another. These periods were, however, broken by brighter interludes which were repetitions of my earlier experiences when the injection of vaccine was undoubtedly producing excellent effects.

Summing up the whole matter, I concluded that the ordinary gonococcal vaccine is a poor antigen, but that occasionally one hits off a method or happens to use a strain which results in a vaccine of good antigenic power. The conclusion is not original, since many workers, amongst whom I would mention Eyre, Nicolle and Blaizot, and McDonagh and Klein, have studied to improve the antigenic power of gonococcal vaccines, either by selection of strain or by method of preparation. The difficulty until recently has been to estimate the antigenic power of different vaccines by serological methods. McDonagh and Klein suggested that strains which were good antigens in the complement-fixation test should be selected for use as vaccines, and I think that in the complement-fixation test we have the best means of testing the antigenic power of a vaccine, though not quite in the manner suggested by McDonagh and Klein.

*Inquiry in Regard to Gonococcal Vaccine.*

When Captain Thomson joined as pathologist at Rochester Row in 1916 I suggested to him that gonococcal vaccine was a subject well worth study. Captain Thomson [1] began by devising a culture-medium on which gonococci grow profusely, and was thus able to command a large supply of gonococcal emulsion for experiment. A further step was made when the method of performing the complement-fixation test by preliminary fixation for many hours in the ice-chest proved to be a great improvememt in regard to its delicacy. This improvement was suggested by the work of Mr. F. Griffith and Dr. W. M. Scott, of the Local Government Board Laboratory, who have extensively investigated preliminary cold fixation in the Wassermann test for syphilis. Then Captain Thomson found that the gonococcus is very soluble in alkali, and this has led to improvements in the method of preparing gonococcal vaccines which I hope that Captain Thomson and Captain Lees will have an opportunity of explaining to you. I will not trespass on their territory more than to sum up the matter thus. One may divide a gonococcus into two constituents, stroma and toxin. The toxin has very slight antigenic power in the quantities of it which can be administered with safety, while the stroma freed from its toxin can be administered in such large amounts that a far quicker antibody response is produced than by injection of the ordinary emulsion. Captain Thomson's vaccine is, therefore, gonococcus stroma minus gonotoxin, and is a far better vaccine than any I have yet seen administered. Fortunately for Captain Thomson's investigations he has had the advantage of collaborating with Captain Lees, whose careful observations of the clinical effects of the vaccine have proved of the greatest value.

*Nature of Antigenic Effect.*

It has been urged in some quarters that the good effects which have been noted in the complications of gonorrhœa as following on the injection of vaccines are not due to a specific antigenic effect but to that non-specific effect which has been termed protein shock, or, as Auld has termed it, pyrogenic therapy by the injection of foreign substances into the blood stream. There is no doubt that pyrogenic therapy is a most valuable aid to the treatment of metastatic gonococcal infections, especially arthritis, and we have a fairly large series of cases now in which the intravenous injection of 120 millions of ordinary antityphoid vaccine has produced most striking improvement. The dose is repeated, or increased to 150 millions, in about five days, and the improvement is proportional to the reaction produced. Very much the same effect is produced by the injection of intramine, but, on the whole, I think that the antityphoid vaccine produces the quicker results. At one time we had half an acute ward on the antityphoid injections and the other half on intramine. They ran one another very closely, and the effect was always proportional to the general reaction. I have not yet tried horse serum, but believe that a similar effect would be produced. I do not think that the good effects we have experienced from vaccines depend on the same principle as protein shock because the new gonococcal vaccine produces little or no general reaction and we have had no good results from intramine or antityphoid vaccine unless a general reaction was produced.

*Discussion.*

Captain D. THOMSON said that although about 90 per cent. of 200 clinicians who had written on vaccine-therapy in

[1] THE LANCET, 1918, ii., 42.

gonorrhœa were in its favour very little experimental work had been done to explain the cause of their success. Using the amount of complement-deviating substances as an index, he had been able to show that antibodies could be evoked in the human by the use of gonococcal vaccine; the serological results obtained were illustrated diagrammatically. He had succeeded in detoxicating the vaccine, thus permitting the use of much larger dosage than had formerly been possible—e.g., 10,000 millions of cocci could be injected without producing more than a slight reaction. The detoxicated vaccines were very successful in inducing the formation of anti-substances. If the complement deviation could be raised to 10 or 12 positive, no cocci were obtainable from the infected source.

*Clinical Evidence of Value of Detoxicated Vaccine.*

Captain D. LEES, speaking from the clinical point of view, said that he had compared the therapeutic results in five series of cases, each series being specially treated. Those which cleared up first and spent the shortest time in hospital were treated by vaccines. The remaining series in order of therapeutic success were cases treated by mercury for three days and then by vaccines, cases treated by medicine and irrigation, cases treated by mercury alone, and, lastly, cases treated only by rest in bed, without local or general measures. The cases treated by vaccine were characterised by a greater moderation in symptoms, absence of complications, improvement in general condition and mental outlook, less time spent in hospital, and freedom from relapses. Certain groups of cases had been treated by detoxicated vaccines. One such consisted of 12 cases complicated by epididymitis in all of which cocci were found. 2500 million organisms were injected, the dose being subsequently worked up to 10,000 million. The acute cases cleared up very quickly, 1 in 6 days, 1 in 7, and 1 in 15; all have reported regularly since, and with one exception have kept free from infection. Another group was composed of 3 cases complicated by prostatic abscess. On an average the cocci disappeared in 45 days, the discharge in 59, the prostatic enlargement in 62, and the period in hospital was 69 days. Two cases with multiple arthritis and active gonorrhœa were similarly treated; the gonococci disappeared in 4 days, the discharge in 16·5 days, and the joints were normal in 56 days. The prostatic cases stood the treatment less well than the epididymitis cases and showed more focal reaction; in the joint cases there was no focal reaction and the general reaction was slight. A series of acute cases of five to seven days' duration was then treated, and the results were very striking. Comparative results of cases treated by no vaccine, by ordinary vaccine, and by detoxicated vaccine emphasised the value of the last as gauged by the complement deviation, the length of period preceding disappearance of organisms and discharge, and the duration of stay in hospital. With this treatment local reaction was practically absent, focal reaction slight for one day, and general reaction also slight except in one case. Disappearance of symptoms, cocci, and discharge was rapid. No complications developed except slight folliculitis in one case. The clinical results therefore tallied with the serological. He was convinced that the treatment is a valuable adjunct to that usually employed.

*Views of Other Speakers.*

Lieutenant-Colonel R. BOLAN had critically scrutinised the effect of the treatment by vaccines in a hospital of which he was in charge, and expressed himself as satisfied that the method was the best yet employed.

Captain D. WATSON was in almost complete agreement with Colonel Harrison. With him he favoured urethro-vesical lavage. He had given up all attempts of doing good by internal methods. His experience with vaccines had been varying, and he had seen cases where harm had been caused by their use. In 307 cases of acute gonorrhœa, the average stay in hospital had been 26·8 days. In 222 treated by acriflavine the period was reduced to 21 days. Twenty-six of these were accompanied by complications; in the remaining 196 the average stay was 19·8 days. Six per cent. relapsed. Complications arising in the 222 cases were epididymitis in 2 cases, subacute prostatitis in 2 cases, cystic abscess in 3 cases. The treatment must be continued for 10 or 12 days, although the discharge ceased after 3 or 4. The strength employed had been 1-4000 acriflavine with normal saline.

Captain EDWIN DAVIS, U.S.A., who had worked experimentally with acriflavine, considered that it is worthy of a more thorough trial, for it inhibits growth of gonococci in 1-300,000 dilution, does not lose its power in urine, shows a great tendency to penetrate tissues, and, moreover, is non-toxic and non-irritating.

Mr. CAMPBELL WILLIAMS spoke critically of many of the procedures adopted in the treatment of gonorrhœa, notably the giving of injections with the patient lying on his back, the use of mechanical apparatus for elevating the containing vessel, and the application of a band around the penis. He cited an instance where the disease had been prevented after infection. Relapse was frequently due to reinfection from small glands in the neighbourhood of the frenum, and treatment directed towards them would often avoid it.

Colonel HARRISON briefly replied.

## ROYAL SOCIETY OF MEDICINE.

### SECTION OF MEDICINE.

*Apyrexial Symptoms of Malaria.*

A MEETING of this section was held on Jan. 28th, Dr. A. F. VOELCKER (Major, R.A.M.C.T.) being in the chair.

Captain GORDON WARD read a paper entitled "Apyrexial Symptoms of Malaria." The object of the paper was to provide guidance as far as might be for those who might be called upon to report (1) as to whether a man showed signs of having recently had an attack of malaria; and (2) as to how far a man was disabled owing to chronic malaria, the existence of which in the case was not denied. It was anticipated that such questions would arise after the war in industrial spheres and before pensions boards. The class of case met with would be quite different from anything hitherto widely known in Great Britain and, to a large extent, very different from the class of case met with amongst inhabitants of a malarial country. The paper was based on observations made on over 1000 cases of soldiers under treatment in hospital. These had contracted the disease in various parts of the world, but were seen only after their return to France or England. Owing to the needs of military service the patients were taking quinine during the period of observation. It was believed that the picture of malaria seen in these circumstances was that which would be met with in civil life for some years to come.

*Symptoms.*

The following list of symptoms did not profess to be exhaustive, but comprised those most likely to be of value.

1. Apyrexial rigor. A typical malarial rigor with shaking and hot and sweating stages might occur with no rise of temperature. This would not be often met with, but a knowledge that it did occur might prevent mistakes.

2. Herpes labialis was common the day after an acute attack.

3. Headache. This was frontal as a rule, sometimes occipital, almost never vertical. Temporal and frontal headache together were often seen. The patient's statement might often be verified by detecting hyperalgesia at the margins of the area in which pain was felt.

4. Eye signs. Conjunctivitis, photophobia, and nystagmoid jerking were frequent in acute attacks. In chronic cases photophobia, pain behind the eyes, and rarely strabismus, were seen.

5. Pharyngitis and laryngitis both occurred in association with acute attacks, just as they did in influenza and many other fevers.

6. Jaundice. Some people seemed especially prone to jaundice after attacks of malaria. A slightly yellow colour was suspicious in chronic cases.

7. Perisplenitis. A friction rub (lasting three to five days) might be heard over the spleen in a few cases.

8. Pain in the side. This might be due to pleural adhesions. If so, it was felt most on deep inspiration, and a course of deep-breathing exercises would often dispel it. It might be due to splenic adhesions when more complaint was made when the patients stood for long or took much exercise. These two occurred in chronic cases, and both were often due to malaria, the former, of course, indirectly. Pain in the side might also depend on hyperalgesia of the skin or muscles. It was then at times bilateral. This was frequent in acute cases.

9. Tremor. A fine tremor of the tongue and hands, rarely of the lips, was common. It might persist in chronic cases, and was then often associated with chronic headache and depression.

10. Pigmentation. At times pigmentation was seen to increase with attacks and diminish between them; this was a good but rare sign.
11. Tachycardia was common when the patient first got out of bed, and might persist or only be elicited on exertion.
12. Hyperidrosis. This was not infrequent, although not often complained of. Occasionally it was so severe as to constitute a serious disability.
13. Splenomegaly. This was an uncertain sign in cases such as those under consideration. It occurred in indisputable form in severe attacks and when jaundice also was present.
14. Transient œdema. Local swellings of the nature of giant urticaria were sometimes seen on hands or legs; they lasted a few days only.
15. Raynaud's symptoms. "Dead fingers" and feet were often seen.
16. Weakness was often complained of, but was hard to assess. With the patient under observation it could be done by various tests, but must, as a rule, be a matter rather of opinion than demonstration.
17. Blood changes. The presence of the parasite was definite evidence. The presence of an increased number of "mononuclears" was of no value. A fall in hæmoglobin always needed explanation, but was not necessarily due to malaria. An increase of eosinophils was suggestive of malaria, as also was the presence of endothelial cells. The total number of white cells was of no particular value in diagnosis. The presence of abnormalities of the red cells, such as polychromasia, anisocytosis, and megalocytosis, was important and strongly suggestive of malaria.

In addition to the above, transient hemiplegia had been seen. Leg pains similar to those of trench fever were to be expected in a certain proportion of cases. Purpura was rare in the class of case dealt with. Urticaria and mastitis and a specific rash had been noted by some writers. Sudamina were not rare. Albuminuria would be of importance, but there was no opportunity of inquiring into the point.

*Discussion.*

Colonel ANDREW BALFOUR spoke of the relapses as probably indicating sporulation in internal organs. He agreed as to the occurrence of apyretic rigors, which usually merged later into more definite pyrexial relapses. It was questionable as to whether the rectal temperature would also have been found to be normal. If the thick film method of examination had been used the chances of finding parasites would have been increased. He raised the question of hepatic tenderness after malaria, a sequel which he thought not uncommon. It was difficult to state definitely that all the symptoms were malarial in origin.

Dr. F. S. LANGMEAD deprecated the common fault of ascribing all symptoms occurring in people coming from a malarial country, or even in malarial subjects, to the malaria itself. A more patient examination would sometimes show that a patient who was regarded as suffering from an unusual form of malaria was really the subject of an independent or secondary infection. Despite this warning, he agreed that malaria was almost as protean in its manifestations as Captain Ward had declared. He had had facilities for observing about 10,000 cases of malaria, and agreed as to the occasional occurrence of rigors without fever. Such rigors were frequently accompanied by malaise, headache, sweating, rapid pulse, mental depression, and even by vomiting. Cases had been seen of all degrees, ranging from those with rigors without alteration of temperature, through those with rigors where the temperature only attained the normal line, and those where the rigor was associated with a very slight pyrexia, up to those with characteristic pyrexial attacks. Pigmentation might be so severe as to resemble that of Addison's disease, and with this he associated also cases with temporary or persistent low blood pressure and small pulse, possibly ascribable to suprarenal defect. Defective action of this gland and also of the thyroid was suggested by the tachycardia, tremor, and exophthalmos which had been referred to and which certainly occurred. He had come to regard tachycardia in malaria as occurring in three clinical forms: (1) a transient form abating with or soon after an attack; (2) a more persistent form which subsided after several days or weeks; (3) a chronic and protracted form which possibly would remain permanent. It was difficult to say when the last two forms were indications that the malaria was merely in abeyance. Statistics as to the efficacy of various forms of treatment in preventing relapses were unreliable, as what constituted a relapse was often decided by rule of thumb and apyrexial attacks were not considered.

Dr. J. A. ARKWRIGHT spoke of the presence of urobilin in the urine as a valuable help in diagnosing malaria in the absence of a paroxysm.

Captain WARD briefly replied.

## TUBERCULOSIS SOCIETY.

*Practical Remarks on Tuberculosis in Relation to the Upper Air and Food Passages.*

A MEETING of the Tuberculosis Society was held at the Royal Society of Medicine on Jan. 27th, under the presidency of Dr. HALLIDAY SUTHERLAND.

Dr. DUNDAS GRANT in a lecture on the above subject touched upon most of the conditions which tax the resources of the tuberculosis officer and the medical officers of sanatoria and hospitals. Many of the forms of treatment of tuberculosis of the larynx are only suitable for the specialist, but Dr. Dundas Grant gave an optimistic review of the results obtained by the simpler methods. Attention was called to rest to the larynx by silence and the voiceless whisper, much improvement occurring in the voice and condition of the vocal cords in a few weeks. Although a "useful" cough was to be permitted, many coughs by patients were useless and injurious. Much of this injury might be avoided by the voiceless cough practised without closure of the vocal cords. Continuous inhalation, advocated by Dr. Burney Yeo and Dr. David Lees, was referred to, but Dr. Dundas Grant considered its value chiefly due to relief of cough and not to any bactericidal effect. He recommended the following inhalant:—

| | |
|---|---|
| Creasot. ... ... ... ... ... ... ... | 3iii. |
| Ol. pini sylvest., spir. chlorof. ... | aa 3iss. |
| Ol. cinnamon., ol citronell. ... ... | aa mv. |

With menthol gr. v., gradually increased unless found irritating.

Nasal obstruction and nasal catarrh had a markedly detrimental effect upon laryngeal disease, and he said that these conditions should receive full attention. The use of a simple alkaline and antiseptic nasal lotion, employed with the aid of Grant's inspiratory nasal douche, of the following formula was often followed by very good results:—

| | |
|---|---|
| Sod. biborat. ... ... ... ... ... ... | gr. xcvi. |
| Sod. chlorid., sod. salicylat. | aa gr. xlviii. |
| Glyc. pur. ... ... ... ... ... ... | m lxxii. |
| Aq. menthol. ... ... ... ... ... ... | ad ℥ vi. |

A teaspoonful to the ounce of warm water.

In local conditions with great pain removal of portions of the epiglottis or the aryepiglottic fold had frequently to be performed, but in a great measure these procedures were obviated by the use of the galvano-cautery, the results in disease of the larynx, tongue, and nose being most gratifying. In this connexion inhalation of orthoform and anæsthesin by means of Leduc's powder inhaler, which the patient could learn to use by himself, was advocated and described. Dr. Dundas Grant said that the injection of alcohol into the superior laryngeal nerve to produce complete anæsthesia might with a little practice be accomplished with fair precision, affording great benefit. In concluding he mentioned the treatment of enlarged tonsils and adenoids, the remote effects of which were of such importance in the chest disease of the child.

## SOCIÉTÉ DE BIOLOGIE, PARIS.

THE following is a summary of some of the papers read at the meeting of the society held on Jan. 25th:—

P. PORTIER.—Development of Larvæ on Sterile Food.

L'auteur a observé le développement complet des larves de *Ténébrio molitor* obtenues au moyen d'une nourriture stérilisée à haute température (130°). Les animaux dans ces conditions sont approvisionnés de symbiotes par un mécanisme spécial (cryptogames ou micro-organismes inclus dans leurs tissus) qui s'y développent et échappent à la carence.

MICHEL SIEDLECKI (Cracow).—Remarks on the Terrifying Attitude in Animals.

A propos de ce qu'on appelle "la position terrifiante" des animaux. 1° La position de bataille et celle qu'on appelle terrifiante ne sont pas les mêmes. 2° Très souvent la position terrifiante n'a pas de valeur pour la défense de l'animal. 3° La position terrifiante peut être provoquée non seulement par la présence de l'ennemi au voisinage de l'animal, mais aussi par différents autres agents, soit la fatigue, soit en général une irritation de tout l'organisme.

Dr. BONNEFON.—Régeneration and Revivescence.

"Régénération" n'égale pas "reviviscence." Les éléments cellulaires *morts* sont remplacés par des cellules étrangères au greffon. Il y a donc régénération et non reviviscence. Quant à la trame connective du greffon qui sert de canevas à cette régénération, elle n'a pas à mourir, ni pas conséquent à survivre ou revivre puisque c'est un "coagulum inerte." Elle ne peut qu'être assimilée. Tous ces faits ont été liés et interprétés au cours des recherches d'avant guerre sur la greffe de la cornée.

L. LAUNOY.—Antagonistic Action of Blood Serum against Bacterial Proteases.

Il résulte de ces recherches que pour des actions protéolytiques qualitativement égales, l'action du sérum sanguin est beaucoup plus faible sur les protéases microbiennes que sur la trypsine. D'où l'auteur conclut que l'interprétation qui fait du pouvoir antitryptique du sérum un phénomène banal, est incompatible avec les faits. D'autre part, l'auteur a obtenus par l'injection au lapin de protéases microbiennes l'apparition dans le sérum de propriétés inhibitrices très énergiques. Ces propriétés inhibitrices sont spécifiques pour la protéase injectée.

A. GRIGAUT, A. RANQUE, et Mme. POMMAY-MICHAUX.—Measurement of Bacterial Proteolysis.

Les différents microbes de la plaie de guerre, ensemencés sur le milieu à l'œuf, déterminent une protéolyse plus ou moins abondante dont la marche peut être suivie commodément au moyen du procédé de nessérisation décrit par les auteurs. Le dosage de l'azote non protéique notamment permet d'apprecier le *taux* de la protéolyse dans un milieu de culture déterminé et de *mesurer l'activité protéolytique comparée des différentes espèces ou associations microbiennes.*

F. CHEVREL, A. RANQUE, CH. SENEZ, et E. GRUAT.—Vaccine Therapy in Influenza.

Les injections intraveineuses de vaccin pneumo-streptococcique iodé parfaitement toléré ont amené des défervescences brusques avec guérison dans de nombreux cas à complications pulmonaires graves. Dans les septicémies à streptocoques le vaccin n'a pas donné de résultats appréciables ; par contre dans les septicémies à pneumocoques, la vaccinothérapie a donné des résultats excellents.

# Reviews and Notices of Books.

*Training and Rewards of the Physician.* By RICHARD C. CABOT, M.D. London and Philadelphia: J. B. Lippincott Company. 1918. Pp. 153. 5*s.* net.

THE title of Dr. Richard Cabot's work is somewhat of a misnomer in that the book says not much about the studies and curriculum of a medical school. One admirable point in the work is the insistence with which Dr. Cabot urges the necessity for the physician being trained to understand his fellow men, seeing that patients are not merely "cases," but human beings with their own very real troubles and limitations. We must take exception to Dr. Cabot's statement on p. 45 that the physician,

"during his experience as a hospital interne tends ..... to discard whatever he had known of human feelings, fears, delicacies, aspirations, and especially to ignore the differences of individuals and their need of individual treatment ... the young doctor at the end of his internship is often more nearly dehumanised than at any period in his life—before or after his hospital year."

We cannot think that this is strictly true; in our experience a year's work as a house surgeon or house physician in a big hospital will teach a man more about his fellow men and their needs than he would learn in the same time in almost any other work.

Dr. Cabot lays stress upon an important point which the ordinary public is in danger of forgetting and which many medical men do not realise, and that point is that nowadays the main work of the medical profession is devoted to doing away with illness—i.e., its own professional source of subsistence. While writing on this subject he quotes from a letter written by a patient suffering from tuberculosis who mentions that in June, 1903, he consulted a

"physician regarded as eminent in his profession and a man of long experience. I had then lost about ten pounds in weight. He examined me carefully, examined my sputa, found tubercle bacilli ....."

The patient continued to lose weight—namely, 8 lb. more in three weeks—and continued under the care of the physician until August, during which time "nothing was said to me in regard to outdoor living." He then read an article on open-air treatment in a popular magazine and, after consulting another physician, tried it together with rest, and recovered. Dr. Cabot quotes this incident as an example of the good which may be done by articles on medicine in the lay press. Such articles may, as in the above instance, do good, but they often do harm, and we must express surprise at a physician "regarded as eminent in his profession and a man of long experience," who, moreover, knew about tubercle bacilli, being either ignorant of, or incredulous as to the benefits of, open-air treatment so recently as the year 1903. Public experience had made the value of open air public knowledge years before—in this connexion we may note that one of the earliest references in the lay press to the benefits of open-air treatment appeared in Lytton's "Strange Story," first published in 1862, while Reade used the same incident in "Foul Play" a few years later. A fine chapter in Dr. Cabot's book deals with the rewards of the physician. What these are we must leave to readers of the work to find out; we will merely quote Dr. Cabot's last sentence. Of the practice of medicine he says: "Its rewards, as I see them, are beyond those of any other profession."

*United States X-Ray Manual.* Authorised by the Surgeon-General of the Army and Prepared under the Direction of the Division of Roentgenology. New York: Paul B. Hoeber. 1918. Pp. 506. $4.00.

THIS volume supersedes the small manual hurriedly prepared at the beginning of the war and is to serve as a guide to radiologists taking up military work, as well as a text-book for those without previous X ray experience. It is in consequence a very complete and concise treatise on the whole subject of X ray diagnosis, prepared with much care, containing numerous illustrations and diagrams which remove all ambiguity with an absence of superfluous verbiage. While, naturally, military practice predominates the line of demarcation between this and civil practice is really a very narrow one and the fundamental principles are the same. It is thus not too much to say that as a text-book for those who aim at proficiency in X ray diagnostic methods this would be hard to beat.

Every branch of the subject is treated as fully as the occasion demands, neither too much nor too little, and it is unnecessary to pick out any section for special comment. Great praise is due to those responsible for its production, not omitting the publisher, whose work is exactly suited to a book of this kind.

*The Chemistry of Synthetic Drugs.* By PERCY MAY, D.Sc. Lond., F.I.C. Second edition, revised and enlarged. London: Longmans, Green, and Co. 1918. Pp. 250. 10*s.* 6*d.*

THE progress that has been made in this country since the war in the production of synthetic drugs, formerly confined to Germany, adds considerably to the interest of this volume, now brought to a second, revised and enlarged edition. It is good to learn from an authority like Dr. May that though the manufacture of synthetic organic chemicals on a large scale presents many difficult problems, yet most of these have been successfully overcome by British chemists in so short a time; but he rightly points out that these successful efforts some day will come up against the vast and highly organised German organic chemical industry. That will present a problem which it will be the duty of our fiscal authorities to solve, but there is another point to be remembered. There can be little doubt that it would be an advantage if many of the synthetics were ruled out so far as regards therapeutics. As this book shows, it is not difficult to modify the structure of many compounds and to build up by the substitution of groups an extensive series of products which have a commercial impulse behind them rather than a pharmacological interest. Mainly addressed to the chemist who may not happen to know the exact chemical nature of these preparations, the book nevertheless affords attractive reading to medical men, who may thus trace the relationship of constitution (groupings) to therapeutic action.

*Stoicheiometry.* By SYDNEY YOUNG, D.Sc., F.R.S. Second edition. With 90 figures in the text. London: Longmans, Green, and Co. 1918. Pp. 362. 12*s.* 6*d.*

THE not very elegant word "stoicheiometry," the title of this book, implies a study of the laws governing chemical combination and their application to chemical calculation. This study involves a consideration of atomic values, according to latest determinations, of the functions related to these values, the properties of the different forms of matter as we know it, the solid, liquid, and gaseous states, the properties of all three states, their behaviour to one another, as in the solubility of gases and solids in liquids,

absorption, adsorption, and so forth. These subjects form the conspectus of the ground traversed by Professor Young, who has devoted himself to theoretical questions with the thoroughness and detail which have characterised his studies since the early days of his professional career. The practical importance of his work is revealed throughout the pages of the book, wherein the painstaking labour of investigators is revealed in sequence since the classic work of Stas (1831–1891), who, in spite of relatively simple facilities, obtained values so accurate that to this day they are retained as representing the truth as near as we can reach it by modern knowledge. It is of interest also to remember that Stas laid the foundations of the methods employed to the present day in the separation and identification of alkaloids. Professor Young has made a very important addition to a valuable series of text-books of physical chemistry, first issued under the editorship of the late Sir William Ramsay.

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*Introduction to Inorganic Chemistry.* By ALEXANDER SMITH. Third edition, rewritten. London: G. Bell and Sons, Ltd. 1918. Pp. 925. 8*s.* 6*d.* net.

Professor Smith's teaching experience at Columbia University, where he is a professor of chemistry and administrative head of the department, has led him to try how best to open his subject to beginners, whether at university, college, or school. He makes the study of chemistry of interest from the start by coupling with the reading of this book a systematically arranged course of laboratory work in general chemistry, and the early chapters contain a discussion of a few typical experiments which bring before the student's consideration the manifold and broad questions with which chemistry deals, and the real purpose of its study. The theoretical portions are clearly written and well sustained by practical illustrations. This third edition is brought up to date, as evidenced in the chapters on dissociation, ionisation, and the modern methods of writing formulæ expressing reversible reactions.

There have been issued also two further books by the same author and publishers. One, *A Laboratory Outline of College Chemistry* (pp. 206, 3*s.* net), and the other, *Experimental Inorganic Chemistry* (pp. 170, 3*s.* 6*d.* net), which both form excellent guides to practical work in which particular attention is given to those details which, when instructions are followed, carry experiments to a successful issue and ensure accurate training.

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*Veterinary Post-mortem Technic.* By WALTER CROCKER, B.S.A., V.M.D., Professor of Veterinary Pathology, University of Pennsylvania. With 142 illustrations. London and Philadelphia: J. B. Lippincott Company. Pp. 233. 16*s.* net.

As stated by the author in his preface, "the scientific study of pathology without proper post-mortem technic is impossible," and it is with a view to describing to the student the proper way to make a post-mortem examination that books of this kind are written. Veterinary literature has not been enriched by many books upon this subject, and Dr. Crocker's work should certainly be welcomed by many readers. It describes in full detail all the particulars necessary for exposing the important organs to be examined in cases of death from any special (or, indeed, any ordinary) disease, and the illustrative plates are excellently made, so that with these and the text no student can possibly go wrong.

The descriptions are a little American in style, and occasionally the expressions strike an Englishman as not being quite those he has been used to in student days, but they are very clearly put, and autopsies of all kinds of animals and birds are fully detailed. It is a book particularly useful in these days where even the ordinary practitioner is called upon to find certain hidden glands in order to obtain microscopic preparations from them and otherwise examine them. The clinical practitioner is apt to forget their exact locality, and as some are quite small he has difficulty in finding them. From such a book as this for reference he can obtain all the help and guidance he needs, and a most useful chapter is given on the average measurements and weights of organs. The book should be bought; if it goes too fully into small details the fault is on the right side. The author deserves every praise for a work which will be of real use to the veterinary profession.

## JOURNALS.

*British Journal of Children's Diseases.* Vol. XV., October-December, 1918. Edited by J. D. ROLLESTON, M.D.—In their article on Ruptured Aortic Aneurysms in Childhood Dr. E. Bronson and Dr. G. A. Sutherland record a case of death due to the rupture of a fusiform aneurysm of the ascending arch of the thoracic aorta in a boy aged 5 years and 10 months. The aneurysm apparently followed a partial stenosis of the aorta between the insertion of the ductus arteriosus and the left subclavian artery. That this structure was a congenital anomaly was supported by the presence of a diaphragmatic hernia, subluxation of the joints, and defective cranial development. The writers classify aneurysms in childhood into (1) arterio-sclerotic; (2) traumatic; (3) embolic or septic; (4) false due to erosion from without; (5) due to congenital anomalies. The present case was an example of the last group. Two other instances on record of aneurysmal dilatation due to partial stenosis of the aorta are summarised, as well as five cases of aneurysms apparently due to congenital anomalies in the structure of the ductus arteriosus. In two of the latter rupture caused death. The writers have found in the literature seven reports of death following rupture of thoracic aortic aneurysms in children, one case of rupture of the aorta without aneurysm, and two cases of aneurysms of the abdominal aorta. A complete bibliography is appended.—In an article on the "Food Deficiency" or "Vitamine" Theory in its Application to Infantile Beri-beri, Major F. M. R. Walshe summarises the present state of our knowledge of beri-beri as follows. Beri-beri is dietary in origin in that it is associated with a physiologically inadequate diet. Yet the purely negative vitamine-starvation explanation of its pathogenesis, apart from the inadmissible nature of its contained assumption that a disease which clinico-pathologically is clearly an intoxication could be *solely and directly* caused by the mere *absence* of anything from the food, is inadequate in that it does not recognise the existence of the two factors essential to the production of the disease. These two factors are: (1) the absence of an unknown accessory factor or vitamine; and (2) the consumption of carbohydrates.—In a note on Abnormal Naughtiness in Normal Children, Dr. John Thomson points out that cases of this kind are essentially of the same nature as those of "moral imbecility" in children who are to some degree mentally defective. The proper treatment is as follows: (1) all severe corporal punishment must be stopped—it never does any good; (2) nobody must ever appear shocked, amused, or even surprised at anything the child does; (3) his misdeeds are never to be alluded to in his presence; and, lastly, he should be noticed and encouraged in every way when he is good, and altogether ignored when he is naughty.—Dr. Reginald C. Jewsbury records a case of Muscular Spasm in a Child, which Dr. F. Parkes Weber, in his remarks on the case, shows is the first example published in England of "Dystonia Musculorum Deformans" (Oppenheim) or "Progressive torsion spasm of childhood." The present case is exceptional in that hitherto the disease has been described only in Russian, Polish, and Galician Hebrew families. It runs a chronic progressive course with intermissions and even with periods of improvement, and may then come to a standstill, other portions of the nervous system remaining unaffected. It is characterised by a peculiar mixture of hypertonus and hypotonus of the affected muscles. The face and muscles of articulation are usually not affected except in late stages, when there is involvement of the muscles of the neck. Among the earliest symptoms is partial or total loss of function of one or more extremities due to faulty tonus innervation. Talipes tends to persist. The movements of the affected parts are spasmodic, but not truly athetotic. Psychical symptoms may occur, but the mental condition is generally normal.—The abstracts from current literature deal with diseases of the alimentary canal, surgery, orthopædics, and ophthalmology.—The very full index contained in this issue should be an invaluable guide to current pædiatric literature.

*Journal of the East African and Uganda Natural History Society.* No. 13, November, 1918. London: Longmans, Green, and Co. Price, to non-members, 5*s.* 4*d.*—Among the contents of this issue is an article by Mr. A. Blayney Percival on Game and Disease, in which the author develops his view that Nature has her own methods of preventing the spread of disease among wild animals, while at the same time she utilises disease as one method of ensuring the survival of the fit. Ngar narua he identifies with anthrax, and states that the Masai recognise the disease as one which man may contract. The Masai's treatment of the human patient is to promote perspiration by wrapping him in the freshly stripped warm hide of an animal, at the same time depriving him of all milk, giving him to drink only a decoction of a native root. In British East Africa, according to the author, both game and cattle have developed to some extent immunity against rinderpest, while the wart-hog has failed to do so.—In his notes on East African snakes Mr. A. Loveridge shows

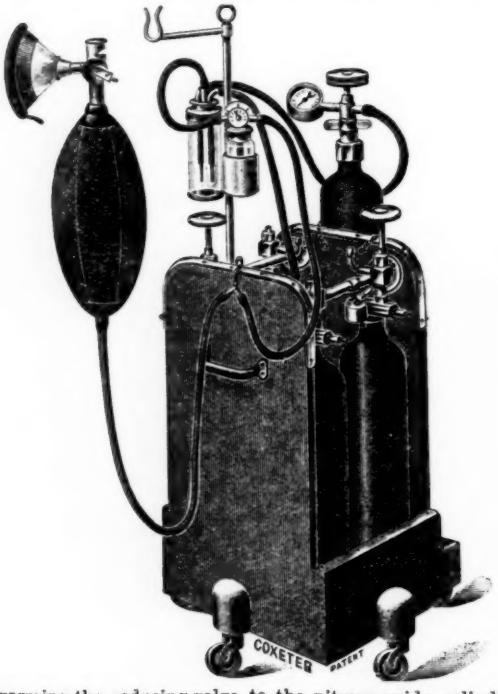
that there is no easy criterion for distinguishing between poisonous and harmless species, variations in colour and shape of head being inconclusive.

*La Medicina Ibera* (Madrid, weekly) has now entered on its second year of publication, and may be congratulated on having won for itself a distinctive place among Spanish medical journals. Its abstracts of articles in Spanish, British, French, and American periodicals are a prominent feature and are excellently done. In the number before us—that for Dec. 28th last—Dr. Encinas abstracts the Spanish and Dr. Zapata the foreign journals. It is not easy to make abstracts interesting, but both writers have succeeded in doing so, thanks to an easy and lucid style and a sure judgment for salient points. Original articles are contributed by Dr. Villaverde and Dr. Alvarez. The former writes on "Spasm of the Orbicularis Palpebrarum and the Cervical Muscles," and discusses an interesting case in which bilateral orbicularis spasm, leading to almost complete closure of the eyelids, and causing the patient to throw his head back in order to see through the narrowed palpebral aperture, was followed, after a time, by a tonic contracture of the cervical muscles, fixing the head in the position at first adopted voluntarily. The case is of special interest in that the electrical reactions of the facial nerve were perfectly normal and that, of the muscles supplied by the facial nerve, none but the two orbicularis muscles were affected in the slightest degree.—Dr. Alvarez writes on Milk as a Vehicle for Iodine. His article is a somewhat enthusiastic plea for a wider use of free iodine in therapeutics as against the mineral iodides, and for milk as the vehicle *par excellence* for its administration.

# New Inventions.

## NITROUS-OXIDE-OXYGEN-ETHER OUTFIT.

THE accompanying illustration depicts one of the patterns of the above machine. The main points are: (1) each cylinder is provided with a fine adjustment reducing valve (the valves are so constructed that they can be fitted to any ordinary English cylinder); (2) the principle of the "sight feed" has been adopted; (3) there is a small spirit lamp for




warming the reducing valve to the nitrous oxide cylinder; (4) a pressure gauge is attached to the oxygen cylinder; (5) a small rebreathing bag is attached, together with an ordinary 3-way stopcock and face-piece; (6) an ether bottle is connected up in the circuit; (7) the machine has been made in three sizes:—(*a*) The large size for work abroad. This machine, when fully charged, takes 4 cylinders of 200 gallons, 2 of 500 gallons, and 1 of 40 ft. capacity for oxygen. (*b*) The next size—the one depicted here—is meant for work in hospitals at home, and carries 4 cylinders of nitrous oxide of 200 gallons each, and a 20 ft. cylinder of oxygen. Types (*a*) and (*b*) are on wheels, and can easily be moved about. (*c*) The size for private practice takes 4 cylinders of 100 gallons, 2 of nitrous oxide, and 2 of oxygen. Cylinders of 25 or 50 gallons capacity can be used with this pattern. This type is so devised that the stand carrying the "sight feed" bottle and the ether bottle can easily be dismounted and securely stowed away between the cylinders. There is a covering lid and carrying handle.

These machines are economical in consumption of gas. 80 gallons of nitrous oxide and 20 gallons of oxygen are usually enough for one hour's continuous anæsthesia. I have now completed over 2000 personal administrations with this method, and am able to record over 1600 administrations by Captain Trewby and the residents at the 1st London General Hospital, making a total of over 3600 cases without any fatality. I desire to thank Captain Geoffrey Marshall, R.A.M.C., for many and valuable suggestions with regard to what was, or was not, required for use with this machine in France.

H. EDMUND G. BOYLE,
Captain, R.A.M.C. (T.); Anæsthetist to St. Bartholomew's Hospital.

## A MODIFIED BUCHNER'S ANAEROBIC TUBE.

THE advantages claimed for this method are: (1) Simplicity. No special apparatus is required. (2) Tubes are shorter and less cumbersome than ordinary Buchner's tubes. (3) Economy of materials, which are readily obtained and are portable and compact. (4) Good anaerobiosis is secured. (5) Any medium can be used for cultivation.

The requirements are:—

1. A strong glass test-tube 6 inches long with an internal diameter of 7/8 inch and a well-fitting rubber cork of 1 inch diameter.
2. The medium tube, containing liquid or sloped solid media of any kind, of a length of 5 inches, with an internal diameter of 7/16 inch.
3. Four leaves of ordinary thick blotting-paper cut to a size of 4 × 3 inches.
4. Pyrogallic acid powder 1 g.
5. Caustic potash solution 16 c.cm. (Stock solution 109 g. caustic potash dissolved in 145 c.cm. water. Diluted 1 in 4.)

The conditions requisite for good absorption of oxygen in a vessel by alkaline pyrogallic acid solutions are: (1) large surface area of pyrogallic acid solution: (2) small air space containing the oxygen to be absorbed. These conditions are obtained in the manner shown in the accompanying diagram.

*Method of use.*—The dry pyrogallic acid powder (1 g.) is placed in the bottom of the outer tube. The four layers of blotting-paper, between the layers of which a little pyrogallic acid powder is placed, are wrapped round the medium tube, the long axis of the paper in the long axis of the tube. Medium tube and layers of paper are then slipped into the outer tube. (Outer tubes can be kept ready for use containing the blotting-paper layers and pyrogallic acid powder.) The caustic potash (16 c.cm.) poured into the outer tube, and the medium tube is rapidly slipped into the centre of the paper cylinder. As the medium tube is pushed in, the alkaline pyrogallic acid solution mounts as a thin layer between the outer tube and the medium tube to within a short distance of the top of the latter and drives out the air from the outer tube, thus reducing the amount of "dead space" from which oxygen must be absorbed. The rubber cork is pushed tightly into the mouth of the outer tube, the rim of which is sealed with paraffin wax. The layers of blotting-paper absorb a portion of the fluid and give to the absorbed pyrogallic acid solution a large surface area for the absorption of oxygen. The medium tube is suspended in the pyrogallic acid solution.

That good anaerobiosis is obtained is indicated by the fact that a tube containing 5 c.cm. of ordinary 1 per cent. glucose broth containing a solution of methylene blue or litmus is rendered quite colourless in 24–48 hours. Litmus milk tubes are also decolourised. The tube should, however, be left 2–3 hours to allow oxygen absorption to take place before incubation. Good surface growths of anaerobes with discrete colonies have been readily obtained on human serum glucose agar medium by this means.

H. J. B. FRY, M.D. Oxon.,
Captain, R.A.M.C. (T.F.).

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—A clinical meeting will be held to-day (Friday, Feb. 7th), in the society's rooms, West London Hospital, when cases will be shown at 8 P.M.

# THE LANCET.

*LONDON: SATURDAY, FEBRUARY 8, 1919.*


## The Medical Aspects of Flying.

ELSEWHERE in our columns we publish two papers which, although dealing primarily with the aeronautical side of medicine, are capable, in our opinion, of wider application. Dr. LOUIS STAMM describes a new form of reaction time apparatus which in his hands has proved of great value in assessing the mental qualities of flying pupils. It is true that with the coming of peace its application for the selection of officers appears to be somewhat curtailed, since the necessity for differentiating temperamentally the various types of pilots is no longer a matter of urgency. Indeed, for commercial purposes the good, steady, bombing pilot, or the unperturbed artillery observation officer, will possibly be looked upon with greater favour than the "star" of great stunting and fightiug propensities. Nevertheless, in times of peace such an apparatus could undoubtedly be profitably used in the selection of airmen, and will probably prove of value in elucidating nervous conditions associated with "flying strain." Dr. STAMM attaches great importance to the more elaborate tests, and believes that these are of considerably greater value than the simple reflex times which can also be recorded. In view of the work done by Professor NEPPER and others on these simple reflexes, and the considerable importance attached by the French authorities to such tests, it will be interesting to see if the work of others confirms this opinion. It appears too soon to discard such simple tests altogether, and the matter must be investigated more fully. Apart from the examination of airmen or would-be candidates for aviation, it appears that the tests of Dr. STAMM are likely to be of considerable value in the examination of cases of shell shock, neurasthenia, hysteria, and other allied nervous conditions, and might profitably be worked in conjunction with "emotive" observations on the psycho-galvanic reflex.

The second paper, by Lieutenant-Colonel MARTIN FLACK, is in some ways of more immediate importance. With the coming of commercial aviation it will be a matter of supreme importance that only fit pilots are allowed to take passengers into the air. It will be particularly desirable that no pilot shall be liable to any breakdown which may endanger the lives of those entrusted to his care. Since all the tests described in the paper have had the normal standards set by observations upon successful flying officers, it appears to us that tests such as these should be employed in the examination of peace-time pilots. If properly carried out, the results of such simple tests will convey a fund of useful information to a medical officer called upon to examine airmen, and by a comparison with results previously obtained an opinion will be formed as to the manner in which the subject is standing the strain of his occupation. The treatment of "flying stress" is essentially a preventive treatment, and careful examination along the lines suggested should be especially fruitful in preventing the onset of undue fatigue. It will give early indications of the need for rest on the part of the subject and prevent the bold and intrepid airman taking the air when, as not infrequently happens, he is not altogether in a fit condition to do so. Besides being of value from the point of view of the selection of the flying officer, we understand that the tests have proved of considerable value in assessing the effects upon the individual of what may be termed "minor crashes."

Apart, however, from their value in relation to flying, it appears to us that the tests will ultimately be found to be of wide application. With suitable modifications and appropriate standards they may be introduced into the various medical examinations in which the aim is to obtain an idea of the physical efficiency of the subject. In the past the physician has frequently concentrated his attention on the study of the abnormal, and has not assessed the normal at its true value. In a similar way the physiologist, while studying the more abstruse problems of the healthy body, has tended to overlook the value of such simple tests in estimating its efficiency. We believe that the simplicity of these tests will appeal to many and will serve to strengthen the bond of service which should exist, but too frequently does not, between physiology and medicine. Thus far in science there has been too much work in watertight compartments and insufficient liaison between the various branches. It is to be hoped that the time has now come when a close relationship will be maintained among the various scientific allies whose duty it is to make for the building up and preservation of the efficient state.

## The Teaching of Medicine.

THERE are manifestations just now of a greater interest in medical education than has been known for a generation, and of a widespread conviction that reform is imperative. It is satisfactory to find that the monograph of Sir GEORGE NEWMAN, whose views must be of great practical value at this juncture, has stimulated thought and discussion on a complex and difficult question. In Scotland, as well as in England, the same interest is being evinced: the Edinburgh Pathological Club, for instance, has recently debated two papers by Mr. J. W. CRERAR and Dr. D. E. DICKSON on the Training of Medical Students for General Practice,[1] wherein the existing curriculums are closely scrutinised. The arguments in these two papers are not always directly applicable to English schools, but the defects of medical education in Edinburgh, as expounded at the Pathological Club meeting, are generally similar to those perceived by English educational authorities to be present south of the border. In some respects, however, changes advocated by English authorities have been inspired by a desire to bring English methods of teaching to a nearer approximation to Scottish practice.

Sir WILLIAM HALE WHITE is a consultant physician of unrivalled authority and experience as a teacher of

[1] Edinburgh Medical Journal, December, 1918, p. 350, et seq.

clinical medicine. His summary of the problem of post-graduate medical education in our columns on Jan. 4th includes principles which command universal assent, but when he comes to his own province of "primary" education in clinical medicine he becomes at once more detailed and more definite. He goes right to the heart of one of the difficulties of the medical reformer in London: the fact that the material rewards of moderately successful consulting practice are enormously greater than such emoluments as even the best and most hard-working of medical teachers can expect. This is a difficulty which is more acutely felt in London than elsewhere, in marked contrast to Edinburgh, which suffers less than many other schools from this disturbing factor. Sir WILLIAM HALE WHITE would forbid the chief of a medical clinic to engage in private practice, whether as physician, surgeon, or obstetrician; and if the salary of such a professor, as he would be called if any semblance of a chair were found for him, were large enough, and if such *imponderabilia* as professional status and public recognition were certain enough, there is a great deal of force in the arguments by which abstention from actual practice could be justified. But in present circumstances it is possible neither to offer sufficient salary nor to fulfil the other conditions named above, as far as London teachers are concerned, and, we should say, as far as the teachers are concerned in any part of England. Unless this state of affairs is fully faced any comprehensive scheme for reforming medical education is academic rather than practical. State aid is necessary; and with this the long-proposed principle of amalgamations among London medical schools can be combined. Sir WILLIAM HALE WHITE'S plan would ensure the student receiving his teaching in clinical medicine from at least three teachers instead of from one only: a plan which, he believes, is good not for the student alone but for the teachers also. That must be rather a matter of surmise. The actual contact with the patient in the wards has always been the great point of London medical education, a contact which the inexhaustible clinical material of London has rendered peculiarly easy, and one which all our provincial schools try to provide for their students.

The equipment of the medical student for general medical practice presents at every centre of medical education one great problem—how best to correlate clinical teaching with laboratory work. Mr. CRERAR advocates that the general practitioner should be trained to do bacteriological work for himself; he dislikes the mere laboratory diagnosis of diphtheria. The tendency of the day is rather in the opposite direction of specialisation in clinical pathology, a tendency easily to be explained by the ever-increasing multiplicity and complexity of the work done in the laboratory. But it is absolutely necessary that the clinician should be associated with the pathologist and the bacteriologist in treatment. They study the patient from different angles of vision, and perspective is best attained when they exchange their points of view, while their intercourse should be free and frequent. It is in assessing the value of recent developments of laboratory diagnosis that general practitioners are often at sea; and many of them feel that of late years they have not had altogether the happiest of guidance in such questions from those leading teachers and consultants from whom they have the most right to expect it. Too often methods of diagnosis and treatment have received the blessing of well-known teachers and clinicians, only to prove, after longer or shorter experience, to be fallacious. Many a practitioner has had to face this experience of feeling himself "let down" by those in authority, whose vigilance has been, to say the least, insufficient. And such failures not merely discourage the practitioner genuinely anxious to keep abreast with modern research; they directly encourage quackery amongst the less scrupulous, and rule-of-thumb methods amongst the lazy. Proper relations at all educational centres between the laboratory and the ward on the one hand, and proper relations between the clinical and the pathological aspect of disease in the practitioner's mind on the other hand, should alter all this, and it should not be impossible to secure these things.

## Belgian Doctors' and Pharmacists' Relief Fund.

AT the last meeting of the Executive Committee of this Fund a letter, a translation of which is reproduced in full on p. 235, was received by the Committee from Dr. V. PECHÈRE, the President of the Comité National de Secours et d'Alimentation (Aide et Protection aux Médecins et Pharmaciens Belges Sinistrés). The Comité National is the body sitting in Brussels to whom the dispensation of the contributions of the Funds in behalf of the suffering Belgian doctors and pharmacists in Belgium has been entrusted. The Belgian Doctors' and Pharmacists' Relief Fund has raised upwards of £25.000 during its life of a little over four years. The greater part of this money has been received directly from British doctors and pharmacists at home, in the Colonies, and in India, though during the closing stages of the war substantial grants have come from the American Red Cross, to the enormous benefit of the charges of the Fund. After the immediate wants of Belgian doctors and pharmacists and their families, arriving in this country as refugees, had been met by the Fund, the bulk of the money was duly distributed in monthly donations varying from £800 to £400 among Belgian doctors and pharmacists remaining in Belgium, the organisation of which Dr. PECHÈRE is the head undertaking the difficult and delicate task of distribution. Dr. PECHÈRE'S committee has wisely husbanded the contributions sent to them, so that a certain amount of money should remain in hand for the succour and rehabilitation of Belgian doctors and pharmacists after the war; and it goes without saying that the extraordinarily generous suggestion of Dr. PECHÈRE, which will be found in his eloquent letter of gratitude—that this money should be returned to the Fund—has been disregarded by the Committee of the Fund. It was definitely stated in the original programme of those who organised the Fund that it would be impossible for British doctors and pharmacists to give too much money, because, when the immediate needs had been met, those of rehabilitation must remain and be very heavy. Many doctors and pharmacists in Belgium were materially ruined and would not be able to return to work without pecuniary grants. All readers of the medical and pharmaceutical journals who have kept the objects of the Fund in recollection will approve of the decision of the Committee of the Fund.

The Belgian Doctors' and Pharmacists' Relief Fund is closed as from Monday next, Feb. 10th, the small sum remaining in the hands of the honorary treasurer being probably sufficient to meet any remaining calls from Belgian refugees in this country. The Fund has disbursed the whole of the sum collected—over £25,000—save £90; and the cost of collection and distribution has been under £200, including the printing and postage of circulars and reports at war rates. The secretarial work and that of the treasurer have been done gratuitously, both by the officers named and by their assistants; a large proportion of the postage has been defrayed by THE LANCET; the auditors made their inspections of and reports on the books of the Fund for a nominal fee; and the Bank treated the Fund with special courtesy. These are the things that account for the economical administration of the Fund's resources.

# Annotations.

"Ne quid nimis."

## THE CONTROL OF TUBERCULOSIS IN FRANCE.

FRANCE, ahead of this country in so many departments of preventive medicine, has yet been tardy to take any concerted action in controlling the ravages of the tubercle bacillus; and with the history of the opposition to such measures in this country still vividly before the mind our Paris Correspondent's graphic story of the conflicting currents of medical opinion in Paris makes excellent reading. The great majority of doctors in France are, he says, hostile to the compulsory notification of tuberculosis. So they were in this country; but the notification has been confidential, has not broken that deep-seated instinct of professional secrecy which Paris holds as dear as London, the Frenchman as dear as the Briton, and notification has now, in consequence, no considerable body of opponents. Our Correspondent pictures the unhappy position of the notified patient when the agent of the local authority arrives with imposing apparatus to disinfect him and his dwelling, thus spreading terror among the indignant neighbourhood. Doubtless where tenement houses are the rule rather than the exception, the necessary measures of control and hygiene may attract undue attention, but in this country the tact of the tuberculosis nurse and sanitary inspector have already won the day. It is only exaggerated language that has ever described the tuberculous patient as a social pariah in this country or in France, and the tendency is but slightly marked in the stratum of society which provides the largest number as well as the highest percentage of tuberculous patients. The segregation of the advanced case of tuberculosis is of all measures the most practicable and the most urgent, and it should be possible to concentrate upon this without interfering unduly with the legitimate liberty of the subject. The Paris discussion is not without bearing on our own circumstances, where the return of the ex-Service and repatriated man constitutes a problem in tuberculosis control as urgent as any other problem facing us; and, unless properly handled, this problem is likely to cast a shadow on a generation or more.

## SUGGESTED LUNACY REFORMS.

THE spirit of reconstruction, so much in the air, has recently been conspicuous in regard to our arrangements for those suffering from mental disorder. The results of the treatment of shell shock and other neuro-psychoses, brought into evidence by war conditions, on lines differing from conventional asylum treatment have of late attracted much public attention, and in January, 1918, the Medico-Psychological Association of Great Britain and Ireland appointed a special committee to consider the amendment of the existing lunacy laws. This committee, after lengthened consideration, reported last November in favour of certain radical changes as regards methods of dealing with cases of unconfirmed mental disease. Its recommendations included the establishment of "clinics" by local authorities for the treatment of nervous and mental diseases in their early stages, quite distinct as regards location and management from recognised institutions for the insane, and, where practicable, in the form of an annexe to a general hospital so as to be available for clinical teaching. The extension of the system of voluntary boarders to all classes of institutions for the insane was also recommended, as were facilities for the reception without certification of patients suffering from mental disease in its early stages into homes approved by the Board of Control, whether private or charitably founded, as well as into asylums, registered hospitals, and licensed houses, the only formality being an intimation to the Board of the fact of the patient's reception or removal. The committee, while not advocating, for the present, any complete revision of the Lunacy Acts, conclude their report by suggesting certain modifications of nomenclature as regards mental patients and the institutions for their treatment which would tend to eliminate the stigma attaching to such terms as "lunatic" and "asylum." It may be well to add that the report purports to deal exclusively with English lunacy legislation. The Board of Control in their fourth annual report, issued in August, 1918, express sympathetic views as regards the recognition and treatment in their earlier stages of indications of mental disorder. They proceed to recommend that the existing law should be amended so as to enable incipient or recent cases "to receive treatment in general or special hospitals, mental institutions, nursing homes, or elsewhere for limited periods, say, six months, without the necessity for certification under the Lunacy Acts, provided it has the supervision of the Board." They also approve of the establishment of "sections" (for both in- and out-patients) at general hospitals for the early diagnosis and treatment of incipient cases, including facilities for organised study and research where the hospital is attached to a medical school.

Having stated these expert professional views, we proceed to consider those forwarded to us of a "Conference of the Visiting Committees of the Asylums of England and Wales," which met at the Guildhall (City of London) on Oct. 29th last, having been convened by Mr. Thomas Field, chairman of the visiting committee of the Bucks County Asylum. This may be taken as mainly representative of the lay element in the administration of public asylums outside the county of London, with the addition of a small medical element, its committee including also five

delegates of the Medico-Psychological Association. The conference is reassembling at the Guildhall this week, and it may therefore suffice to say here that amongst the recommendations are that the words "pauper," "lunatic," "lunacy," and "asylum" should be deleted from the lunacy laws; that special mental hospitals for both in-patients and out-patients suffering from incipient or actual mental disease be established by local authorities, and that in such hospitals (not to be under the supervision of the Board of Control) certification should not be required until it may become necessary, in the opinion of the medical director of such hospital, to transfer the patient to an institution now known as an asylum. "Psychiatric clinics," it is suggested, should be established in connexion with every medical school, and proper facilities be provided therein for research and for teaching and training; and that medical officers appointed to institutions for the mentally afflicted should, within two years of their appointment, be required to hold a recognised diploma in psychiatry.

Reviewing these several sets of opinions, it would seem that there is a general consensus of feeling that the time is ripe for the relaxation of the legal fetters which have impeded the medical treatment of mental illness, especially in its incipient stage. In times past actual, as well as alleged, abuses have given rise to panic-begotten legislation, the restrictions imposed by which have tended to curtail the efforts of the conscientious practitioner for his patient's recovery. The restoration of greater freedom in dealing with those suffering from minor mental ailments is desirable alike in the interests of the patient and his doctor, and a reasonable discretion as to the most suitable surroundings for an incipient or harmless case of mental aberration ought not to be withheld. At the same time due precautions are necessary to guarantee the fitness and integrity of those undertaking the personal charge of mental cases, and some form of official approval—not to say supervision—seems indispensable for this purpose. The determination of the best form may appropriately be delegated to the prospective Ministry of Health. Though psychiatry must necessarily remain a specialty of the profession, its practitioners need to keep closely in touch with the advances of medical science, and it is to be hoped that the establishment of local clinics will tend to bring together in greater degree the family doctor and the specialist, at the same time affording opportunities to the general practitioner for a better insight into expert methods of mental treatment. It has been alleged that some medical officers of asylums, by reason of remoteness of their establishments from centres of ordinary medical activity, tend to comparative isolation from their confrères, and better opportunities of intercourse such as would result from the institution of psychiatric clinics would be beneficial to both classes of practitioners. We are glad to see that one of the proposals before the Guildhall Conference is to relieve medical superintendents of mental hospitals, as much as possible, of their administrative, clerical, and routine duties, so as to leave them more time for medical and scientific work. It must be remembered, however, that in comparison with similar establishments in America and on the continent the medical staff is proportionately low in British asylums, and much remains to be done in the equipment of laboratories for purposes of adequate scientific research.

## THE MOBILISATION OF VENEREAL DISEASES.

THE appointment of an Inter-Departmental Committee last week by Dr. Addison to investigate the dangers of communicable diseases incident on demobilisation, and to devise concerted measures to meet these dangers may be taken as a recognition on the part of the Government of the extreme urgency of the situation in regard to venereal diseases. But while the need is so urgent responsible opinions are still sharply divergent in regard to the methods to be employed, and especially whether it is in the best interests of the community at large to popularise precautionary measures to be taken before infection has been incurred. Two important communications which we print this week should be read with close attention. At the Medical Society of London Colonel L. W. Harrison brought forward striking evidence of the value of the abortive treatment of gonorrhœa. We can reckon, he states from his abundant authority, with a fair amount of certainty on all the gonococci within the urethra being accessible to antiseptics on the first day of the developed disease. Promptitude of action is here of the first importance, and diligent propaganda are necessary to promote it. Sir Archdall Reid and Surgeon Commander P. H. Boyden, R.N., take the disinfection back to the very earliest post-contact stage. A swab of cotton-wool, a small quantity of a 1 per mille solution of potassium permanganate, used with sober care, have been effective in protecting 20,000 men—and an untold number of innocent women and children—against infection with the gonococcus. These are results which must be carefully weighed by any committee appointed to consider prevention of venereal diseases.

## THE AMERICAN PUBLIC HEALTH ASSOCIATION AND INFLUENZA.

THE annual meeting of the American Public Health Association was held in Chicago under the presidency of Dr. Charles Hastings, medical officer of health for Toronto, from Dec. 9th to 12th, 1918, after having been postponed from October on account of the severity of the influenza epidemic. Many of the papers contributed dealt, as was to be expected, with influenza in its various phases, and an editorial committee was appointed to prepare and publish a bulletin formulating the facts and opinions brought out at the meeting. The main points in this influenza bulletin may be briefly stated thus. Influenza is believed to be caused by an organism of an infective nature, not yet exactly determined, which lowers the resistance of the body as a whole and of the respiratory organs in particular. This diminution of vital force leaves the system open to the invasion of other pathogenic organisms, of which the most important are the Pfeiffer bacillus and various strains of pneumococcus and streptococcus. Certain of these organisms are regarded by careful observers as the primary cause of the disease; but while one or more of them may be isolated from a particular case, the dominant variety of organism has been found to vary in different parts of the American Continent. As regards the use of prophylactic vaccine, if it is assumed that the cause of the epidemic is an unknown virus it seems impracticable to prevent the primary disease by vaccination with known organisms, whatever theoretical basis there may be for the use of vaccines directed against secondary infections, especially if the vaccine used includes

the organisms responsible for the particular complications ruling in the locality. Vaccines adjusted to meet local conditions have been used, but any evaluation of the reports is premature. Stock vaccines have appeared to mitigate some of the outbreaks and the severity of the complicating infections, but in cases where control observations have been made no appreciable effect has been noted. The fact that the vaccine is usually employed after the epidemic has broken out and is perhaps declining, and that an unknown number of people have been exposed, make it difficult to draw conclusions as to its efficacy. The committee recommends that until such time as the efficacy or otherwise of prophylactic vaccination against influenza has been established vaccines, if used at all, should be employed with control observations, permitting a fair comparison to be made of the number of deaths among the vaccinated and unvaccinated groups. Particular attention should be directed to securing data as to the period in the epidemic at which vaccinated and unvaccinated persons developed the disease. The committee are of the opinion that the indiscriminate use of stock vaccines against influenza alone, or against influenza plus pneumonia, is not to be recommended. On the basis of the most trustworthy data then available a sub-committee of the association appointed to consider the history and statistics of the epidemic estimated that there were not less than 400,000 deaths from the disease in the United States during the months of September, October, and November last, the greater number occurring in the age-group 20–40. An unusually high pneumonia rate for several years to come was held to be a probable after-effect of the epidemic. The report emphasises the comparative uselessness of terminal disinfection, the fact that the taking of alcohol serves no preventive purpose, and the futility of sprays and gargles. Instead of protecting the nose and throat from infection their employment is held to tend to remove the protective mucus, to spread infection, and to increase the chance of infecting organisms gaining an entrance. Assuming that influenza is spread solely by means of discharges from the nose and throat of infected persons, the most effective method of prevention lies in sputum control and in the supervision of food and drink. Isolation of infected persons will achieve this end and should be enforced as far as possible. The desirability of wearing masks during an epidemic was discussed at considerable length, and it was pointed out in an editorial in the *Journal of the American Medical Association* for Dec. 21st, 1918, that "evidence leads to the opinion that, properly used, the face-mask has value in the prophylaxis of influenza." Whether it is practicable on a wide scale the editorial committee holds to be quite a different matter.

## RUPTURE OF THE CARDIAC VALVES DUE TO AN EXPLOSION.

Traumatic rupture of the cardiac valves is a rare accident; only about 80 cases have been recorded. In the war French writers have reported cases of lesions produced by explosions, often at some distance, due to the concussion of the aerial waves (the "wind" of the explosion). Rupture of both lungs and lesions of the nervous system have been described. But not till 1918, after three years of war, was a cardiac lesion recorded. Cramer then described a case of aortic insufficiency due to an explosion, and later Brossard and Heitz two cases. The question has been raised whether such lesions may not have been due to the projection of the patient against the ground. In the *Paris Médical* MM. M. Perrin and G. Richard have recently reported two cases which are important, because the only explanation of the lesion appears to be the force of the explosion.

In one the patient was a strong but obese soldier, aged 36 years, who had been carefully examined on several occasions, and special attention paid to his heart, because of slight dyspnœa on exertion. In the battle of Cappy on Sept. 26th, 1914, he received a bullet wound in the thigh. While being removed with other wounded in a cart a shell burst near it, smashing one of the wheels. The wounded were much shaken, and the patient was rendered unconscious for a few seconds. On recovery he complained of oppression and pain in the chest. He was evacuated to a town in the interior, and suffered from attacks of suffocation ever since the explosion. When he came under observation again in 1917 he had resumed his occupation of commercial traveller. He had regained his weight, but was sallow, and suffered from dyspnœa and palpitation on going upstairs. The heart was hypertrophied, the apex beat being in the sixth interspace two fingerbreadths outside the nipple line, and there was aortic regurgitation.

In the second case a woman, aged 46 years, was in good health until a bomb dropped within 3 metres of her during an air raid on Nancy on Oct. 6th, 1917. The violence of the explosion was such that she felt lifted from the ground and would have fallen if she had not taken hold of railings. She felt an acute retrosternal pain, but was able to get home, a distance of 400 metres. On the way she bled severely from the nose. During the following days the pain disappeared, but there was dyspnœa on the slightest effort. When examined a fortnight after the accident the pulse was 88, small and irregular, and there was an apical systolic murmur which was propagated in all directions, but principally towards the axilla. In January, 1918, these conditions persisted. Probably the chordæ tendineæ of the mitral valve were ruptured.

In none of the necropsies in cases of traumatic rupture of the mitral valve was the valve itself found torn; the lesion involved the chordæ tendineæ and the musculi papillares, and the former twice as often as the latter. Numerous cases have been published of rupture of cardiac valves due to violent effort. Rupture of the aortic valve is more frequent than rupture of the mitral, and this than rupture of the tricuspid. Only a single case of rupture of the pulmonary valves appears to have been recorded.

## SAFE ANÆSTHESIA.

A YEAR ago, in discussing the use of gas and oxygen as an anæsthetic mixture, we suggested that anæsthetists might congratulate themselves on being able to bring the comforts of a non-toxic anæsthesia within the reach of a large proportion of patients undergoing operation. Since then the method has had a further extended trial with the armies in France, and it can hardly be doubted that many lives have been saved thereby. It has been observed at more than one casualty clearing station that multiple amputations carried out under gas and oxygen anæsthesia recovered, while men who submitted to similar operation under other anæsthetics died. Gas and oxygen has been found to be the only anæsthetic tolerated in the case of wounded men suffering from serious collapse. At home, in the wards of the 1st London General Hospital and of Queen Alexandra's Hospital for Officers at Highgate, many profoundly septic cases have taken this anæsthetic with happy results; five cases of amputation at the hip-joint in men who were already profoundly toxæmic all recovered. We therefore call attention with pleasure to the outfit described by Mr. H. E. G. Boyle, Captain, R.A.M.C. (T.), on p. 226 of our present issue. Mr. Boyle there records 3600 administrations by himself and others without

fatality. In a number of abdominal operations a little ether or chloroform-ether mixture was used to supplement the nitrous oxide and oxygen. This addition is stated not to prejudice the well-known condition of well-being that follows the administration of this anæsthetic. Patients regain consciousness almost at once when the administration stops; little, if any, taste of ether or chloroform remains and vomiting is exceptional. Certain objections there are to this method of anæsthesia, and for the most part of an obvious nature. Steel cylinders to contain compressed gases are at present heavy and expensive, and gas is liable to be wasted by accidental escape at high pressure with damage to tubes and alarm to the patient. The expense, while inevitable, is one which the private patient is likely to face gladly enough. The substitution of air for oxygen suggested, on the basis of his own experience, by Dr. J. H. Fryer, Captain, R.A.M.C. (T.), on p. 216, would tend towards economy. Mr. Boyle states that with his apparatus the cost of materials works out at about 10s. an hour. The difficulty in regard to weight has been to some extent surmounted, as Type (c), for private practice, weighs only some 60 lb., allowing for 2¾ hours' administration. Waste of gas has been practically abolished by the use of reducing valves on the cylinders. Other more elaborate safeguards have been tried. At one casualty clearing station in France an ingenious arrangement for equalising pressure has been worked out by the Rev. J. A. Gray, M.C., who has administered several hundred anæsthetics with it for Dr. J. Basil Cook and Dr. A. W. H. Donaldson, Majors, R.A.M.C. (T.). Oil drums, adapted to rise and fall on the principle of the large gasometer, were inserted between the cylinders and the inhalation-bag. The two medical officers substantiate Father Gray's claims for his appliance, which are as follow:—

1. The drums automatically stop the flow of gases from the cylinders when the containers rise to a certain height, thus avoiding any danger of wasting gas, straining, or bursting the bag or rubber tubes. The breathing bag can never be more than nicely full, as the pressure in the gasometers is only sufficient for this.
2. They ensure a reserve of gas sufficient for the requirements of the patient, when a cylinder runs empty, and afford the anæsthetist convenient time to replace the empty with a full cylinder.
3. The gases enter the mixing chamber at an unvarying pressure throughout the time that the patient is under. Once complete anæsthesia is reached the patient continues to breathe steadily for a long time, almost without attention from the anæsthetist, whose only duty usually is slightly to increase the flow of oxygen from time to time if the operation is a long one, and to note the gauges on the cylinders to see that they do not run empty.

The mechanical difficulties of this safe and comfortable form of anæsthesia are thus being surmounted, and we doubt not that administrators will readily acquire skill in the new technique.

## FAMILIARITY WITH THE OPHTHALMOSCOPE.

IN a symposium on the teaching of eye diseases in the medical curriculum, published in a recent issue of the *Edinburgh Medical Journal*, Dr. W. G. Sym, recognising the fact that the average practitioner almost never uses an ophthalmoscope, deems it hopeless to expect to alter this state of things, whereas Dr. Freeland Fergus would not let a man enter the medical profession unless he can use an ophthalmoscope almost with the same facility with which he uses a clinical thermometer. In view of its importance in the diagnosis of syphilis, diabetes, arterio-sclerosis, nephritis, pernicious anæmia, tabes, and especially in cerebral tumour, it would seem that Dr. Fergus is right. At the same time, if the student is only taught its use in connexion with a special course on eye diseases we believe in the majority of cases the ultimate effect will be but slight. The remedy is for the student, having early in his course got over the technical difficulties of mastering the instrument, to be required to employ it during his medical training on every case when it might throw light on diagnosis. In this way the student would realise its importance in connexion with general disease and come to look upon it as a necessary part of his equipment.

## THE LANCET, AUGUST 24TH, 1918.

THE Manager of THE LANCET would like to re-purchase or to receive copies of the issue of August 24th for which readers may have no further use, to enable him to replace copies for libraries and institutions in India and the East which were lost at sea owing to enemy action. Such copies should please be addressed to him at 423, Strand, London, W.C. 2.

## CANADA.

(FROM OUR OWN CORRESPONDENT.)

### *Lepers in Canada.*

WHILE leprosy is still endemic in Louisiana, and 400 or more cases have been recorded this century in this and other North American States, Canada is fortunate in having at present a total of only 13 lepers in the lazaretto at Tracadie, N.B., and 5 in the Darcy Island lazaretto, British Columbia. These are the only cases in the Dominion of Canada so far as is known.

### *Pensions to Canadian Soldiers.*

The Board of Pension Commissioners in Canada has authorised the following information with regard to the granting of pensions to the Canadian soldiery:—

1. Soldiers are not pensionable for service only.
2. Pensions are awarded only to cases of disablement due to a wound or disease occurring on, resulting from, or aggravated on service.
3. Disablement is estimated only by the effect it may have upon the soldier's capacity for ordinary work. That he cannot return to his former occupation does not entitle him to a higher pension than the extent of his disability warrants.
4. If a soldier is so disabled that he is completely incapacitated for ordinary work he receives a "total disability" pension, which has been fixed at $50.00 a month.
5. If by his disablement a soldier's capacity for ordinary work is lessened he receives a percentage of the "total disability" pension equal to his handicap.
6. This percentage has been most carefully and thoroughly worked out for every disability, and it is as accurate and fair as it is possible to make it.
7. The earnings a man may be capable of making or the amount of his pre-war earnings will not in any way affect the amount of pension awarded. The extent of his disability is alone considered.
8. Widows of soldiers or sailors who have died are entitled to pensions for so long as they do not marry.
9. Children of sailors or soldiers are entitled to pension up to the age of 16 if boys, or 17 if girls.
10. Pension is only granted to the parents of a sailor or soldier when he was their main support previous to death.

### *Health Department: Province of Alberta.*

A recent Order in Council of the Government of the Province of Alberta has transferred the whole health work of that province to the Department of the new Minister of Municipalities, the Hon. A. G. Mackay, who sounds a note of warning with regard to the proposed municipal hospitals in that province. He thinks that the hospital areas may be too small for safe financing. It would be unfortunate if small districts were saddled with heavy assessments and not have sufficient funds to carry on hospital work successfully; and the Minister states he will not establish a district unless he is absolutely satisfied that the financial position is sufficiently strong. The matter of boundaries must receive careful consideration, as small territories might be left stranded between districts.

### *Improving the Health of Canada.*

Revelations as to the average standard of physical fitness of single men, as shown by the military records in Western Canada, have resulted in the inauguration of a movement

led by the city councils of certain cities in Western Canada, particularly Saskatoon, Sask., to improve the health of Canada as a whole. Representations are to be made to all Provincial Governments and to the Federal Government as well, advising them to take advantage of the records so compiled by the military authorities. The matter has been considered in Council by the Dominion Government, and the Minister of Militia has been authorised to prepare a report on the subject and submit it to Council.

*The Case of Military Medical Officers and Civilian Practice.*

An order has recently been issued: "No medical officer who is engaged in civil practice will be permitted to draw full-time pay and allowances except when sent for temporary duty away from his home station."

## PARIS.

(FROM OUR OWN CORRESPONDENT.)

*A Bill to Provide Treatment for Tuberculous Patients.*

M. Louis Mourier, Under Secretary of State for the Service de Santé at the Ministry of War, has laid upon the table of the Chamber of Deputies a Bill, supported by the Government, the objects of which include the compulsory notification of tuberculosis, the gratuitous treatment in hospital of necessitous consumptives, and the allocation of grants to their families. According to the draft of the Bill every case of pulmonary tuberculosis must be notified within eight days following the establishment of the diagnosis, the notification to be made by the medical man treating the case to a specially instituted sanitary service. The doctor will be required to state in his certificate whether medical care and preventive measures are assured. Should this guarantee, which the sanitary service will have the right of checking, not be produced, the service will invite the patient to attend at a dispensary, where hospital treatment will be prescribed if his physical condition and the absence of available care render it indispensable. When desirable resort will be had to disinfection. Communes, Departments, and the State itself are called upon to provide for the treatment, in or out of hospital, of necessitous persons attacked by tuberculosis, and to give grants to the families in which the supporting member has been sent away to hospital. Penalties are provided for lack of observance of these instructions.

In the preamble to the Bill M. Mourier explains his intention to extend to the whole of the population the benefits of the organisation which has been set up during the war for tuberculous soldiers. He indicates that 55,000 soldiers attacked by tuberculosis have been treated in hospitals and sanitary stations, and that France at the moment has to deal with something like half a million cases of tuberculosis. The amount budgeted for is 84 million francs for setting up the service and 100 million francs for annual expenses.

*The Compulsory Notification of Tuberculosis.*

The announcement that this Bill has been laid upon the table of the House has provoked lively interest in medical circles. It is not the first time that this question has been raised by the Government of the day. Since the year 1890 the Academy of Medicine has five times been asked to give favourable consideration to the placing of tuberculosis on the list of diseases to be compulsorily notified. Four times the Academy refused; the fifth time 46 voted for notification, 45 against, and 1 abstained. It appears that the great majority of doctors is, in fact, hostile to the measure. All the professional corporations have pronounced themselves unanimously against it. The Medical Association of the Seine at its meeting on Oct. 8 h last passed a vote in anticipation that it would not submit to the new Bill if it became law.

Medical men see in it a gross attack on professional secrecy, which must expose the practitioner who violates this secrecy to the mistrust and loss of his clientèle. In cases where the doctor has thought it his duty to notify to the authority the existence of tuberculosis the next item on the programme has been the arrival of a disinfecting engine, which has spread terror among the neighbours, after which the unfortunate tenant has been expelled from the house by the landlord, with no chance of finding other lodging. Notification is received well enough by the public in the case of acute infectious disorders of rapid progress, such as oblige the sick man to keep his bed, when humane feeling forbids the overbearing neighbour to demand his expulsion. It is not the same with the apparently lusty patient who goes about and whom his neighbour desires to see living elsewhere. After a prolonged period of complete indifference to the danger of contagion in tuberculosis the public, under the spell of the vigorous campaign undertaken to spread the fear of contagion and the necessity of serious prophylaxis, is now the prey of a veritable tuberculophobia. The working man recognised as tuberculous is dismissed from his factory; the clerk from his office; the domestic from the house where she serves. All are thus deprived of their means of livelihood and the family which they support is plunged into misery.

*Other Arguments against the Bill.*

Such are the arguments used by the opponents of the Bill. Professor Albert Robin, who may be regarded as their ringleader, adds several other interesting points. He regards disinfection as an illusory measure if not carried out in all the places traversed by the consumptive, or unless he is interned like a plague-stricken subject. Systematic measures of internment or of in-patient treatment would, however, entail, including grants to families deprived of support, an initial expense of 250 million francs and an annual administration cost of 210 million francs. Society, M. Robin thinks, can protect itself at less cost and with weapons of greater efficiency by combating alcoholism, unhealthy housing conditions, and by observance of greater public and private hygiene, and all this can be done without any vexation or economic damage to patients and their families. Efforts already made in this sense have not been in vain, since during the last 20 years tuberculosis has diminished in Paris by one-quarter. And since in practice the State cannot succeed in caring for all the known consumptives, when compulsory notification has made known their exact total, the law will remain a dead letter.

M. Robin proposes, in agreement with the medical corporations, to ask the doctor to notify tuberculosis to the head of the family, who shall turn to the State if he does not possess the power to observe the necessary care and preventive measures. In any case the doctor must not be made the denunciator. For the rest, disinfection of lodgings should be made compulsory after each change of occupant in the absence of a medical certificate to affirm the non-necessity.

*Advocacy of the Compulsory Notification.*

These are the views of the opponents. Compulsory notification, however, has its advocates in the medical faculty. Professor Letulle and Professor Bezançon argue that the war has produced a new situation by spreading over the country thousands of consumptives, some of them ex-service men with disease aggravated by the war, others repatriated from Germany where insufficient food and bad treatment had resulted in the development of the disease. The question is not merely one of caring for the men themselves, but of preventing the infection of the civil population in which they move. They would like to see a number of special sanitary centres set up, directed by competent and well-paid specialists, occupied with this service alone, to whom notifications should be sent by the family doctor, who would continue to safeguard his professional secrecy. These officers would decide if it was desirable for the State to intervene with the measures already enumerated. All agree that the country must be prepared to make every sacrifice to protect itself from a disease which has made great strides during the war and which, at the present rate of progress, threatens in several years to annihilate the greater part of the population, already none too numerous.

The Academy of Medicine has decided, on the proposition of Professor Hayem, in the presence of this new situation, to reconsider the question of notification and has charged a special commission to present a careful report.

VITAL STATISTICS OF CALCUTTA.—In the third December week, the last for which the statistics are available, the total number of deaths registered was 976. Of these 44 deaths were due to cholera (against 41 and 56 in the two preceding weeks), the number being higher than the average of the past quinquennium by 20. There was no death from plague; 3 deaths from small-pox. Deaths from influenza were returned as 277, against 332 in the previous week. Excluding imported cases the death-rate of the week was 52·3.

# THE WORD-ASSOCIATION TEST IN PSYCHIATRY.

*Studies in Word-Association.* By C. G. JUNG, M.D., LL.D. Authorised translation by Dr. M. D. EDER. London: William Heinemann. 1918. Pp. 375. 25*s*.
*Papers on Psycho-analysis.* By ERNEST JONES, M.D., M.R.C.P. Second edition. London: Baillière, Tindall, and Cox. 1918. 25*s*. (See Chap. XXII.)
*The Theory of Psycho-analysis.* By C. G. JUNG, M.D., LL.D. New York: Nervous and Mental Disease Publishing Company. 1915.
*The Psychopathology of Everyday Life.* By Professor Dr. SIGMUND FREUD. LL.D. Authorised English edition by Dr. A. A. BRILL. London: T. Fisher Unwin. 1914.

IT was in 1904 that Dr. C. G. Jung and his colleagues began their researches on word-association, and in a series of some 13 papers they have so elaborated and elucidated the method as definitely to establish its trustworthiness for the investigation of the conscious and the unconscious mind. Yet it has been productive of surprisingly little original study in this country, has aroused comparatively little attention, and has not, apparently, taken any regular place in the routine examination of nervous and mental cases, whereas in America word-association tests have been freely used both in experimental psychology and in practical psychiatry. We may hope for augmentation of interest in the subject in England now that the sources of information are accessible to the English student in Dr. Eder's excellent translation and edition of the original papers of Jung, Riklin, Binswanger, Bleuler, and the others, some of which work, it is curious to remember, was first published in the pages of *Brain* (1907), though at the time little seems to have been made of it.

For a generation writers of psychological text-books have embodied chapters or sections on "association of ideas," and have formulated "laws" and devised experimental illustrations of its action, but they have been singularly lacking in any fertility of application to clinical problems of these psychological laws—an instance of the remoteness of scholastic psychology from the actualities of psychiatry. Word-association as a part of association of ideas is not a novelty; it was alluded to by Galton in his "Inquiries into Human Faculty" as long ago as 1883. To Jung, however, must be assigned the credit of developing word-association into an art, and of raising it to a science. And let it not be supposed that the process is of mere theoretic interest as furnishing suitable exercise for the budding psychologist; apart from its use in the investigation of the normal mind, it constitutes in conjunction with the method of psycho-analysis a diagnostic instrument of the greatest utility, and without its aid psycho-pathology would not have made su strides in recent years. As Dr. Eder remarks, every serious student of psychology, every educationist, everyone who wishes to engage in the study or treatment of morbid mental processes, will find in Jung's "Studies" a storehouse of facts which will serve not only as a solid basis for his own studies but also as a starting-point for further research.

Obviously the first step was to determine the nature of association-reactions in normal individuals, and to be satisfied of their value as an index to the working of the mind, before proceeding to deal with the abnormal. It is a truism that association is a fundamental phenomenon in psychical activity, precisely as is linked neuronic functioning for the physiological activity of reflex arcs; and as differing sensory stimuli may simultaneously compete for and one gain possession of the final common path to motor action, so may psychical associations, concurrently aroused by some stimulus, undergo modification by inhibition, distraction of attention, variability of mood, interest, fatigue, and other psychical factors, whereby development follows, if at all, in one direction only. To simplify the pleomorphic complexity of reaction to a stimulus, to facilitate investigation and to prevent loss of precision owing to the awakening of numbers of more or less distinct presentations in succession, the word-association method requires one response only to the stimulus-word, to be given as quickly as possible, "without thinking" so to say—i.e., without allowing the action of directed or conscious thought to begin at once to modify the train of association aroused. Only thus can any real insight be gained into the processes not merely of the conscious but especially of the unconscious mind. We wish the response to the stimulus to be as inevitable, as immediate, as uncontrolled by higher psychical considerations, as is the orbicularis response to the particle irritating the cornea uncontrolled by conscious interference. Difficult as this may be of realisation in all cases, the fact remains that the method of immediate reaction to a stimulus-word by the utterance of the first word, and no other, thereby presented to the subject's mind has proved of extreme practical value in tracing unconscious mechanisms, not seldom to the surprise of the subject of the experiment.

For ordinary purposes a list of some 100 words is taken (various lists are given in various books; any worker may evolve a separate set for himself) and the subject is directed to give, in answer to each of them in succession, the first word that comes into his mind, while the reaction-time is noted by the observer in fifths of a second. Jung and Riklin worked out no less than 12,400 associations in normal subjects in order to determine "types" of reaction and to ascertain the effects of attention on the association process. Their classification is based on the examination of educated and less educated individuals of both sexes, and may be (incompletely) summarised as follows:—

I. Inner association (associations of affinity or similarity).
1. Coördination: e.g., cherry—apple; pain—pleasure.
2. Predicate relationship (the response refers to the stimulus-word as subject or object, noun-adjective responses, &c.): e.g., glass—brittle; brave—soldier; to polish—brass.
3. Causal dependence: e.g., pain—tears.

II. Outer association (associations of practice or contiguity).
1. Coexistence: e.g., Sunday—church; pipe—tobacco.
2. Identity: e.g., quarrel—dispute; take care—look out.
3. Verbal-motor forms ("mechanical" responses through constant association in speech): e.g., bitter—sweet; white—black; hammer—tongs. Also word-complements: e.g., tooth—ache; fish—monger.

III. Clang-reactions (depending on sound).
1. Word-completions: e.g., wonder—ful; modest—y.
2. Clang: e.g., green—greed; window—winter.
3. Rhyme: e.g., make—shake; Moses—noses.

IV. Residual group, including indirect and meaningless reactions, faults, perseveration, repetition, verbal linking, and egocentric reactions.

Perseveration[1] is of much significance. It consists in an association conditioning or influencing one or more of the following reactions. A fault is the omission of a reaction, usually under the influence of emotion, while the repetition of the stimulus-word is also an emotional phenomenon.

Passing now to some of Jung and Riklin's generalisations, we may cite them without any critical digressions. Where clang-reactions occur they are indicative of disturbance of attention, a fact of much diagnostic value. The educated show a distinctly shallower or more superficial type of reaction than the less well educated, a phenomenon mainly of attention. The chief reasons for this somewhat unexpected result seem to be that for the uneducated subject the experiment is taken more seriously; he is less at ease; influenced by habit, he instinctively apprehends the single stimulus-word as a question or a command, with the intensity of attention necessary for a proper answer. In men indirect associations [e.g., remorse—(mourning)—black; ear—(sound)—ground; mast—(master)—servant; milk—(-maid)—rosy; severe—(father—mother)—dead; &c.] are distinctly more frequent than in women. Indirect reactions may also be taken to indicate distraction of attention.

More important, perhaps, is the differentiation of two general types of response: (1) that of the individual who shows an objective, impersonal habit of mind; (2) that where subjective experiences are made use of, often emotionally charged. In the former the reaction is usually connected by objective meaning with the stimulus-word; in the latter "constellations" occur. Associations which are only explicable by personal events of recent date or of the present moment usually charged with an affective tone, are known as constellations. Further, a complex—i.e., a system of ideas revolving round some central focus constituted by some particular previous experience commonly associated with emotional disturbance, often stands out so prominently and acts so intensively, as Jung

[1] Persistence is a better expression than perseveration, which has quite other significance in connexion with certain organic cerebral symptoms.

says, as to form a whole number of constellations, faults, and reactions with long reaction-time. Such complex-constellations, in the second type, may be expressed undisguisedly, or, and here at length we reach the essence of the method as applied to the neuroses and psychoses, may occur in a disguised form in consequence of a repression which is not always conscious. One of the conspicuous services rendered to psychopathology by Jung and Riklin has been their detection of the effects of unconscious constellation and unconscious repression as revealed in responses to association tests. The departures in such cases from the normal and usual types of reaction are called by them "complex-indicators," and may be enumerated as follows:—

1. Prolongation of the reaction-time.
2. An unusual and suspicious setting of the reaction, frequently in sentence form, not explained by the reaction-word itself.
3. Intrusion of the phenomena of attention. When a complex emerges it draws a certain amount of attention to itself, hence the reaction to a given word becomes unexpectedly superficial, and if the same phenomenon is repeated at a similar stimulus-word the occurrence of some inward distractor is confirmed.
4. Faults. The emerging complex absorbs all the attention.
5. Perseveration. The critical reaction may not have been noticed, but the succeeding reaction is under the influence of the persisting emotional element and is seen to be abnormal.
6. Assimilation of the stimulus-word, which is taken in a peculiar sense or misunderstood in a peculiar way, in accordance with the affective idea filling up consciousness.
7. Finally, in some subjects repetitions of certain words in their answers are often found to be more or less closely associated with the complex, or to represent it indirectly.

It would be easy to give from experience concrete illustrations of the actual occurrence of these complex-indicators; suffice it to say that Jung's contention that minute observation of the subject and his responses enables the worker to detect traces of affective processes linked with concealed or half-concealed complexes is absolutely borne out by experience of the association test. In his own words, "the reactions are an extremely refined reagent for affective processes in particular," which, as we know, play a prominent part in the evolution of the psychoneuroses. No one ignorant of the method can form any true idea of its extraordinary delicacy, and may well be inclined to disbelieve that in such simple means a key to unlock the unconscious mind lies at hand. But that this is so needs no further proof than the experiences of those who use the method. Its relation to psycho-analysis is that of an adjunct; both are technical methods for the exploration of unconscious mental processes. By means of the association test a number of defective reactions—complex-indicators—are obtained, and for their amplification and interpretation psycho-analysis can be used. Freud says that "the dream is the *via regia* to the unconscious," but in word-association tests we have an easy and simple method of reaching unconscious or partly conscious constellations, and not infrequently, in actual practice, one clue thus obtained has sufficed to render possible the unravelling of the whole pathogenic complex. Clinically, it is often enough ascertained that repression is not so complete as is supposed, and, therapeutically, good results often succeed the following up of association clues without resort to intricate and long-continued psycho-analysis.

There is no inherent difference between the word-reactions, as such, of the normal and of the pathological individual. All of us have our complexes and our constellations, and our affective trends too. In the case of the neuroses, however, affective processes play a prominent rôle; in certain conditions, notably hysteria, they are perhaps all-important. Hence studies in word-association in the various neuroses and psychoneuroses may serve to show predominance of certain types of reaction over others, and this is precisely what has been demonstrated by Jung's colleagues. The associations of imbeciles and idiots, of epileptics and hysterics, of sufferers from dementia præcox, have all been patiently worked at, and are particularly instructive from the viewpoint of diagnosis. There is, however, still a vast amount of ground to be covered. Dr C. S. Myers, in his latest contribution to the study of shell shock and allied conditions, begs for investigation of association tests in such patients and of the possible effects of glandular extracts on their reaction-times. Dr. Eder hopes that the application of the method to education will result in the establishment of standard tests for normal and abnormal children, complementary to the intellectual tests standardised by Binet. The method is obviously capable of the widest application. S. A. K. W.

# THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

## MEETING OF EXECUTIVE COMMITTEE: CLOSING OF THE FUND.

A MEETING of the Executive Committee of this Fund was held on Jan. 30th at the offices of THE LANCET, Sir RICKMAN GODLEE being in the chair.

A letter was read from Dr. V. Pechère, the President of the Comité National de Secours et d'Alimentation (Aide et Protection aux Médecins et Pharmaciens Belges Sinistrés). Having been warned by the Chairman of the Belgian Doctors' and Pharmacists' Relief Fund that the reserves of the Fund, which had been able to continue its work steadily until the end of 1918, were now coming to a close, the following reply, brought by hand by Madame Pechère, was received:—

Bruxelles, Dec. 15th, 1918.

DEAR SIR RICKMAN GODLEE,—I have received your kind letter of Nov. 24th and sincerely thank you for it. In writing to you as President of the "Belgian Doctors' and Pharmacists' Relief Fund," I wish to let you know as soon as possible our infinite gratitude for the inestimable kindness that my foreign colleagues, and particularly my English ones, have rendered to the members of the Medical and Pharmaceutical Professions during the war. It goes without saying that our Committee wishes to include all, whoever they may be, in their expression of gratitude, who, either from far or near, have helped to succour their suffering Belgian colleagues.

The praise that you express of all your helpers, especially Dr. Des Vœux, Madame Des Vœux, and their admirable secretary in their generous efforts in favour of the doctors and chemists who took refuge in England, and in the special assistance of Dr. Sprigge (of THE LANCET), so highly appreciated, also of certain ladies attached to your committee; all this is very pleasant to hear.

We wish particularly to thank those who have taken a preponderant part in the joint professional responsibility until we can do so personally, of which I do not despair in the near future. While awaiting the moment we feel our words are insufficient to express our feelings, but, believe me, they are profoundly sincere and addressed to each and all. As to the American contribution sent by the Red Cross, and by the doctors and chemists of the United States, we know they showed great generosity on our behalf. We wrote to Mr. Poland when he was staying in Brussels to express our gratitude. I personally saw Mr H over as he passed through Belgium two years ago, and asked him to express our thanks to those to whom they were due. I am writing to the representative of the American Red Cross in the same terms of gratitude as those expressed in this letter.

We have often written letters to you and to our benefactors, but we are convinced they never reached you. Now that communication is possible, we wish everyone to know that the gifts we have received have helped to better the sad lot of our poor charges (protégés), which was deplorable. Your help will never be forgotten, but the brotherly enthusiasm which stirred up and kept going your inestimable contributions has touched us more than the material help represented.

You tell me in your letter, in reference to a cheque for £400 and another for £800, that our English colleagues have themselves felt the effect of the war and that their generosity has probably reached its limit. That is a thing we can well understand; there comes a time always in giving when, with the best intention in the world, one is obliged to come to a full stop.

We are now feeling scruples, as we have in our possession funds which might be useful to our poorer English colleagues. My Committee unanimously agree that we should return part of the funds. The existence of a considerable sum perhaps needs some explanation. Our grants at the beginning of the war were from 300 fr. to 600 fr. a quarter to each necessitous person. These allocations were raised later to 700 fr. and sometimes 800 fr. in particular cases of an urgent sort. These grants were only given after repeated inquiries, carried out with the closest attention to the financial state of the receivers as we were most anxious to discharge your instructions "only to give to the most needy cases." These funds often had to feed, clothe, and warm families consisting of numerous persons whose source of living no longer existed. If you realise the price of food in Belgium during the war—1 kilo of meat cost 30 fr., 1 lb. of butter 20 fr., one ordinary suit of clothes 350 fr., a pair of shoes 200 fr. I think you will consider we acted with parsimony. Nevertheless, those we helped were contented never complained, showed great courage and endurance. Many gave up the subsidies we allowed them and following the suggestions of the English committee we have often reduced the amount given, allowing only for their necessary wants. (Aux plus basses limites compatible avec les légitimes besoins de nos protégés.) Moreover we had to look to the future, presuming that in the rationed and fighting areas, with which the Germans would not allow us to correspond, there were confrères who might suffer the greatest misery on the retreat of the enemy, and would be obliged to have recourse to us for help, therefore we thought it wise to keep funds in reserve, especially as this applied to all Flanders and part of Hainault (nearly the third of our country). We had also to foresee that we not only had to feed and clothe our friends but might have to provide them with domiciles. Lastly, we thought our help could not end with the cessation of hostilities and must continue for some time, and this did really happen. Notwithstanding the armistice, the price of food is still as high as during the war.

We bear by inquiries and the justifiable demands which are sent by most of our protégés, and by some new ones that help is badly needed. Thus the sums which we have received have not been fully spent, but we shall find the proper employment for them. The resources of our professional societies are very much reduced, the funds from abroad must diminish, or cease. Frankly, our committee, faced by new demands, are glad they have taken such precautions and hope to meet with the approval of your committee. We shall be glad

to hear your views on this matter. In the future, as in the past, we wish to proceed entirely in agreement with you, as the best way in which to prove our gratitude is to act in perfect accord with your intentions.

I shall send very shortly the *procès-verbaux* of our meetings and a résumé of our work and you can judge therefrom of our position.

Veuillez agréer, cher Sir Rickman Godlee, pour vous et vos collègues l'assurance de mes sentiments très dévoués.

Bien à vous,

Dr. V. PECHÈRE.

It was decided immediately to hand to Mme. Pechère the reply of the Executive Committee that there could be no question whatever of the return to the Fund of any donations. It was decided to point out that the Comité National de Secours et d'Alimentation had acted not only with care and foresight but actually in accord with the declared intentions of the originators of the Fund—viz., to reserve as much money as possible to meet the position of "médecins et pharmaciens sinistrés" after the war.

Sir RICKMAN GODLEE called attention to the fact that there remained still at the Hall of the Society of Apothecaries a large assortment of instruments presented by British practitioners. He mentioned that he had received a communication from Mr. Samuel Osborn enclosing letters of thanks for certain instruments already distributed in Belgium. It was decided to send immediately to Brussels those instruments which had already been set in order by an instrument-maker and to remove the rest to the offices of THE LANCET, whence they could be distributed as occasion arose.

Dr. DES VŒUX informed the Committee that early in January Mr. David Wallace wrote from Edinburgh offering a complete hospital equipment to go to Belgium. The Comité National in Brussels were informed immediately, but, no answer having been received from Belgium, Dr. Des Vœux wrote accepting Mr. Wallace's offer, which will be brought to the notice of the Comité through Mme. Pechère.

The treasurer's statement showed that a balance remains in hand of £91 16*s.* 6*d* after the January mensuality of £800 had been despatched. The Fund continues to relieve now and again by small grants certain Belgian doctors and pharmacists or their wives remaining in England, but it was felt that the existing balance at the disposal of the Fund should now meet all such calls in the future. It was consequently decided definitely to close the Fund on Feb. 10 h, and to notify those who have generously given monthly subscriptions that these should now cease. Among these subscribers the Committee alluded with gratitude to the particular generosity of Sir Alfred Pearce Gould.

SUBSCRIPTIONS TO THE SECOND APPEAL.

The following subscriptions have been received up to Monday, Jan. 27th:—

| | £ | *s.* | d. |
|---|---|---|---|
| Hampshire Pharmacists' Association, per Mr. C. H Baker (making £56 5*s.*) ... ... ... ... ... ... ... ... ... ... | 6 | 5 | 0 |
| Dr. Charlotte E. Warner ... ... ... ... ... ... ... ... ... | 1 | 0 | 0 |
| Dr. Alfred Cox (monthly) ... ... ... ... ... ... ... ... ... | 1 | 1 | 0 |

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A Des Vœux, at 14, Buckingham Gate, London, S.W. 1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

## ROYAL COLLEGE OF PHYSICIANS OF LONDON.

AN ordinary Comitia was held on Jan. 30th, Dr. NORMAN MOORE the President, being in the chair.

The following candidates, having passed the necessary examination, were admitted as Members of the College: Dr. C. T. Champion de Crespigny, Dr. W. H. Grace, Dr. N. F. Hallows, Dr. G. R Pirie, Dr. W. G. Porter, Dr. A. F. Rook, and Dr. T. W. Wadsworth.

Licenses to practise physic were granted to 64 candidates, who, having conformed to the by-laws and regulations, had passed the required examinations. Seven Diplomas in Public Health were also granted.

The following were elected councillors on the nomination of the Council:—Dr. H. Davy, Dr. H. Head, Dr. J. W. Carr, Dr. G. F. Still, and Dr. M. Craig.

On the nomination of the Council, Sir Francis Champneys was elected a representative on the Central Midwives Board. Dr. Sidney Martin was elected a representative on the Senate of the University of London, vice Sir Frederick Taylor, resigned.

An address was received from the Royal College of Physicians of Ireland on the occasion of the quater-centenary of the College. A gold Browne medal was received from Dr. R. Crawfurd.

The PRESIDENT announced that he had appointed Dr. Crawfurd to be Harveian Orator and Dr. A. P. Beddard to be Bradshaw lecturer in 1919, and that the Council had appointed Dr. Aldo Castellani to be Milroy lecturer in 1920.

A report was received from the representative of the College upon the proceedings of the General Medical Council in the session held in November last.

The following report was received from the Committee of Management:—

The Committee recommend that the courses of instruction in pathology, practical pathology, and bacteriology, at the University of Cape Town be accepted as fulfilling the requirements of the Regulations, Section II., par. XXI. (*d*) and (*h*) 4, 5, 6, and 8.

The Committee of Management have received an application from the National Hospital for Epilepsy and Paralysis, Queen-square, and also one from the Hospital for Sick Children, Great Ormond-street, for recognition as teaching institutions for students in clinical medicine, and for part of the medical clerkship and surgical dressership. Both these hospitals are already recognised as teaching institutions by the Universities of Oxford, Cambridge, London, and Durham. The Committee of Management feel that it would be highly undesirable for any considerable amount of time spent on clinical instruction and in holding appointments in special hospitals to take the place of the period required in a general hospital, but they offer no objection to a period, not exceeding two months in all, for clerking and dressing being spent at these two hospitals or other special hospitals which may be hereafter recognised by the Committee of Management. With regard to an application which has been made by the Dean of University College Hospital Medical School to utilise this concession, the Committee of Management assume that the National Hospital and the Hospital for Sick Children will allow students from other medical schools than University College to go there in exactly the same way should the deans of their schools desire to send them.

The Committee have also received an application from the London School of Medicine for Women that students may be allowed to complete their gynæcological clerkships at the Elizabeth Garrett Anderson Hospital in which 50 per cent. of the surgical cases are gynæcological. The Committee recommend that this application be granted.

After some formal business had been transacted the PRESIDENT dissolved the Comitia.

## MEDICINE AND THE LAW.

*The Inquest on "Billie Carleton."*

THE inquest held by Mr. S. Ingleby Oddie at the Coroner's Court, Westminster, upon the body of a young woman called Stewart, better known by her stage name as Miss Billie Carleton, was concluded on Jan. 23rd, the death inquired into having taken place on Nov. 27th. The unavoidable length of the proceedings was due not to any doubt that Miss Stewart died as the result of taking cocaine but on account of the desirability of determining by what means and through whom she had obtained the drug. In order to elicit all the facts bearing upon this point a large number of witnesses had to be called, and as many of these were naturally anxious to screen themselves or others their evidence had to be carefully sifted and examined. Those who had some knowledge of the matter were numerous, this being accounted for by the fact that the deceased was one of a group of people on terms of intimacy with one another, whose common interest consisted in their addiction to drugs, and whose common pursuit, in the case at least of some of them, consisted in scheming to obtain drugs for their own or for one another's consumption. An explanation given by a witness named Reginald de Veulle of his own anxiety to have cocaine for use on the night of the "Victory Ball," the night on which Miss Stewart took the dose or doses which proved fatal, may be noted. He said, in reply to a question by the coroner, "It was because I knew perfectly well that I could not get a single drink there." To this he added that he wished to get it for his own consumption only. It was upon this witness that the coroner's jury eventually laid the responsibility for supplying the drug to the deceased, in the following verdict:—

"We find that Miss Carleton died from an overdose of cocaine, self administered, by misadventure, and that she had no intention of committing suicide. We are of the opinion that the cocaine was supplied to her by De Veulle in a culpably negligent manner."

As this amounted to a verdict of manslaughter, the coroner issued a warrant for the arrest of De Veulle, who has since been brought before a magistrate, and comment upon the facts as affecting him must be withheld. The coroner's summing-up, however, of the law with regard to the supplying of cocaine in general contained passages which may be quoted, with a view to their comparison with any future enunciation of the principles to be observed in such cases. Mr. Oddie said—

"Somebody supplied her, that is certain, and it is an unlawful act for anyone to supply anyone else with cocaine. If one person supplies another he is doing an unlawful act. If the cocaine causes death he is guilty of manslaughter. ..... If charged, it is a settled principle of law in this country that if a person does an unlawful act and by that act causes death, even if death was never intended or contemplated, he is guilty of constructive manslaughter."

The illegality of the act of supplying cocaine in the case before him would arise, he explained, under regulations made under the Defence of the Realm Act, and in case the jury might feel disinclined to press hardly against a person infringing a law made more or less to meet the emergency of war, he proceeded to the following further definition of what might constitute manslaughter, saying:—

"If a person does a lawful act which is dangerous to life, and if he does it negligently, and if the jury think that that negligence is gross and culpable negligence, that it shows recklessness and indifference to consequences, and is so grossly negligent, that it shows the person doing it has a wicked mind, and if that lawful, though dangerous, act causes death, then the person doing it is guilty of manslaughter. That is settled law. The Common Law of England provides that people who do dangerous things must use reasonable care, and if the jury decide that such an act as supplying cocaine—which is a dangerous drug if supplied recklessly—negligently, grossly negligently—then you can return a verdict of manslaughter."

In the course of his summing-up the coroner referred to the relations between the deceased and a medical practitioner who had given evidence, and he expressed himself satisfied that this gentleman, as to whose conduct he admitted that he had felt suspicious, had, in fact, tried to persuade Miss Stewart to give up drugs. One of his letters to her, found among her papers, contained the passages:

"I'll do anything to save you from the bottomless pit of darkness, despair, and depression. ..... Get over these lapses. Get over the influence and existence of the damned stuff. Leave it to do its useful work as a local anæsthetic and kill pain, not people."

The concluding phrase quoted by Mr. Oddie is a singularly apt one.

## URBAN VITAL STATISTICS.

(Week ended Jan. 25th, 1919.)

*English and Welsh Towns.*—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality was 15·0, against 16·0 and 15·5 per 1000 in the two preceding weeks. In London, with a population slightly exceeding 4,000,000 persons, the annual death-rate was 14·1, or 0·7 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 6·0 in Bury, 6·8 in Warrington, and 8·2 in Hornsey, to 23·2 in Wigan, 24·6 in Liverpool, and 28·0 in Hastings. The principal epidemic diseases caused 162 deaths, which corresponded to an annual rate of 0·5 per 1000, and included 58 from diphtheria, 48 from infantile diarrhœa, 24 from whooping-cough, 13 from measles, 11 from scarlet fever, and 8 from enteric fever. The deaths from influenza, which had steadily declined from 7559 to 274 in the 11 preceding weeks, further fell to 222, and included 40 in Liverpool, 33 in London, 15 in Leeds, and 10 in Bristol. There were 6 cases of small-pox, 1057 of scarlet fever, and 1174 of diphtheria under treatment in the Metropolitan Asylums Board Hospitals and the London Fever Hospital, against 5, 1092, and 1145 respectively at the end of the previous week. The causes of 36 deaths in the 93 towns were uncertified, of which 9 were registered in Liverpool, 8 in Birmingham, and 4 in Darlington.

*Scotch Towns.*—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was 18·1, against 18·6 and 17·0 per 1000 in the two preceding weeks. The 351 deaths in Glasgow corresponded to an annual rate of 16·4 per 1000, and included 13 from whooping-cough, 3 each from measles and diphtheria, and 2 from infantile diarrhœa. The 138 deaths in Edinburgh were equal to a rate of 21·4 per 1000, and included 12 from whooping-cough, 3 from measles, 2 from scarlet fever, and 1 from diphtheria.

*Irish Towns.*—The 179 deaths in Dublin corresponded to an annual rate of 23·0, or 0·9 per 1000 above that recorded in the previous week, and included 3 from infantile diarrhœa and 1 each from scarlet fever and diphtheria. The 145 deaths in Belfast were equal to a rate of 18·9 per 1000, and included 2 from infantile diarrhœa and 1 from diphtheria.

# Correspondence.

"Audi alteram partem."

## CROOKES'S LENSES.

*To the Editor of* THE LANCET.

SIR,—"Enquirer" and others may find useful a little further information on Crookes's lenses beyond that given in your editorial note (THE LANCET, Jan. 18th, p. 124). Although these lenses have now been for some years on the market, there appears to exist still a good deal of ignorance in the medical profession both as to their composition and their use.

Crookes's A or No. 1 is the glass most used in this climate, and its composition is: Fused soda flux, 83 per cent. and cerium nitrate 17 per cent. It is difficult commercially to get the cerium salt pure, there is present a small amount of didymium which gives the glass a brownish purple tint when viewed edgeways, and gives the whole glass a slightly greyish tint, but this tint is so slight that when worn in spectacles it is indistinguishable from ordinary glass. The value of this glass is that it cuts off the ultra-violet rays of transmitted light without any loss of luminosity. Any ordinary tinted glass, of whatever kind, cutting off the same amount of those deleterious rays is not only extremely unsightly, but also lowers the luminosity to a very marked degree. In photaugiaphobia, or fear of the *glare* of light (differing from photophobia, which is the fear of light), Crookes's No. 1 is invaluable, and myopes who have worn their correction made up with it appreciate it most highly. In work with incandescent gas and electric light it has a most softening and soothing effect. Another important characteristic of this glass is that it does not make the retina more sensitive to light when discontinued, which is not the case with ordinary tinted glasses.

Crookes's B, or No. 2, is only required when great glare is encountered, as in tropical climates or snow regions, or in diseases of the eye which call for smoked glasses. Its composition is slightly different from Crookes's A, having nickel and cobalt sulphate and uranoso-uranic oxide added in small quantities, and it is only transparent to 45 per cent. of incident light.

It is difficult to over-estimate the enormous benefit that these lenses give in correcting errors of refraction, and it is another cause of gratitude we owe to that "grand old man" of science, Sir William Crookes.

I am, Sir, yours faithfully,

Feb. 1st, 1919. ERNEST CLARKE, M.D., F.R.C.S.

## MUCOID FORMS OF PARATYPHOID.

*To the Editor of* THE LANCET.

SIR,—Being on active service I have only just observed the article by Captain W. Fletcher, R.A.M.C., on Capsulate Mucoid Forms of Paratyphoid in THE LANCET of July 27th, 1918. I was particularly interested to read it, as I made a similar observation some time ago and recorded it in my annual report of the Enteric Convalescent Depôt, Naini Tal, which was published in the Army Sanitary Reports, India, 1916. Like Captain Fletcher's cases, mine was also a carrier of *B. paratyphosus B*, and I satisfied myself that the organism was the genuine article. In my report I remarked that I was not aware of a similar observation having been made before.

During 1918 I made an observation on another carrier. I was making daily examinations of an officer who was a chronic carrier of *B. para. B*, and one day through press of work put off the examination of the plate, which had been incubated for 24 hours, till the next day, and meanwhile the plate lay on my table for another 24 hours. By this time I noticed that several colonies showed a secondary (mucoid) growth round their edges, giving the appearance of tiny thickly tyred wheels. Mindful of my former experience, I tested these colonies and proved them to be *B. para. B*. In this particular case the cultural peculiarity of the organism proved a great saving of labour, as it was only necessary to leave the incubated plate for another 24 hours at room temperature for the organism to demonstrate itself by its secondary growth. I never found, though I controlled the observation many times, that in this

particular case did any other organism show the same peculiarity. I should have mentioned that, like Captain Fletcher, the medium I used was Endo's.

The term "mucoid" would appear to be a better one than the one I used—viz., "gelatinoid," as it more accurately describes the appearance of the colonies, but it is just a question whether "zoogloeic" would not more accurately describe this form of growth and I would suggest that it is an indication of attenuation. I am sorry I am unable at present to refer to my notes for more accurate details.

I am, Sir, yours faithfully,

J. C. KENNEDY.
Lieutenant-Colonel, R.A.M.C.

Mesopotamian Expeditionary Force, Dec. 28th, 1918.

## CAUSES AND INCIDENCE OF DENTAL CARIES.

*To the Editor of* THE LANCET.

SIR,—As Dr. James Wheatley's figures with regard to the prevalence of dental caries among children have been cited and admittedly confirmed, it may be well to take note of his figures with regard to dental caries in adults. In a recent lecture he said: "Among 83 women, mostly between 25 and 30 years of age, examined by me for nursing scholarships, the average number of teeth decayed or lost was 17·6." Now, unless these figures are regarded as quite unreliable, it would appear that Dr. Harry Campbell's estimate is not "very excessive," but quite the contrary, and I trust we may not be debarred from further inquiry such as Major Nickolls Dunn urges, by anyone attempting to belittle the seriousness of the state of the teeth, or in any way seeking to hinder research for the truth. When those in authoritative positions know and teach the truth, the diet in the nursery at least will soon be changed; but, to quote from a recent editorial article in a dental journal, "until teachers of physiology in our medical schools recant the erroneous doctrines of diet and nutrition that have been the source of so much misplaced confidence during the last half-century on the part of the anxious-to-learn public, little can be done."

I am, Sir, yours faithfully,

Harley-street, W., Feb 1st, 1919. J. SIM WALLACE.

## WAR DEAFNESS.

*To the Editor of* THE LANCET.

SIR,—Dr. P. McBride seems determined to deprive men suffering from war deafness of the chance of being cured by psychotherapy, as his letter to you of Jan. 25th is, I believe, the third communication to the medical journals attempting to prove that hysterical deafness rarely, if ever, occurs, whereas all who are familiar with the war neuroses know that the vast majority of cases of so-called shell-shock deafness are hysterical and therefore curable, even if complicated by some slight organic lesion, such as a perforated drum. I therefore welcome Captain E. Prideaux's letter of Feb. 1st, confirming what Lieutenant-Colonel C. S. Myers wrote on the subject on Jan. 18th. In the majority of our cases we have not investigated whether the hysterical deafness persisted in sleep, but this was proved quite clearly in two cases which I published with Captain E. A. Peters in THE LANCET on Oct. 6th, 1917. It cannot be too widely known that the old tests which were supposed to distinguish organic from hysterical deafness have proved most fallacious, and that every man suffering from "shell-shock deafness" ought to be given a chance of recovering under psychotherapy.

I was surprised to read Captain Prideaux's statement that there was a disposition for other symptoms to develop after recovery from hysterical conditions. This must clearly depend upon the method of treatment employed. If the simple method of psychotherapy, by means of explanation, persuasion, and re-education, which we have adopted in preference to all methods of gross suggestion, is used, such substituted symptoms hardly ever occur. Among several hundred cases which have been treated in this hospital new symptoms have not followed recovery in more than three or four instances, and in every case the secondary symptom was rapidly cured. On the other hand, it is a daily occurrence for the removal of one hysterical symptom to be immediately followed by the disappearance of other nervous symptoms, whether hysterical or not. For example, the cure of hysterical tremor or stammer, which may have lasted for many months or even for a year or two, at a single sitting is often followed by the immediate disappearance of insomnia, war dreams, and headache, with which they have been associated during the whole period. In the same way the cure of hysterical paralysis of a leg will often be accompanied by recovery of power in the arm in hemiplegia without any treatment being directed to the latter. In the case of a man who had been totally blind for four and a half years after being blown up constant headache and extreme depression, as well as almost complete bilateral deafness, which had previously been regarded as organic, completely disappeared in 24 hours without any direct treatment, as a result of the cure of his blindness by explanation, persuasion, and re-education. I am, Sir, yours faithfully,

ARTHUR F. HURST,
Lieutenant-Colonel, R.A.M.C.

Seale Hayne Military Hospital, Newton Abbot,
Feb. 1st, 1919.

# The War and After.

### AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS.

THE usual quarterly meeting of the committee was held on Jan. 31st at 11, Chandos-street, W. Colonel Ewen Maclean was in the chair. Grants were made to the widows and orphans of four officers and to the widows and orphans of seven men of the rank and file. Widows or orphans of officers or men of the Auxiliary Royal Army Medical Corps requiring help should apply to the Honorary Secretary of the Funds at 11, Chandos-street, Cavendish-square, W. 1.

IT is now officially announced that Colonel A. Webb, A.M.S., at present Assistant Director of Medical Services at the War Office, has been appointed Director-General of the Medical Branch of the Ministry of Pensions.

## OBITUARY OF THE WAR.

### SAMUEL WAUCHOPE MATTHEWS, M.B., B.CH. N.U.I.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain S. W. Matthews, who died at Lindi, East Africa, on Nov. 15th, 1918, at the age of 31 years, was fourth son of the Rev. S. Matthews, of Belgrave-square, Dublin. Educated at the Wicklow Academy, where he was awarded several first places and composition prizes by the Irish Intermediate Education Board, he went on to University College, Galway. He held junior scholarships as an undergraduate and a senior scholarship in his final year, was chairman of the College Debating Society, captain of the cricket and hockey teams, and in 1910 was awarded the President's Medal for oratory. In 1913 he graduated in medicine at the National University of Ireland and was appointed resident at the Children's Hospital, Temple-street, Dublin. He volunteered for service with the R.A.M.C. on the outbreak of war and was sent to German East Africa, where fellow officers testify to his efficient work. Weakened by several attacks of malaria and jaundice he fell a victim to an attack of enteric fever. Captain Matthews was unmarried.

Captain ROBERT PERCY YOUNG, A.A.M.C., who was killed on Sept. 18th, was educated at Caulfield Grammar School, where he played in the cricket and tennis teams, and at Ormond College, Melbourne University, where he was a medical student from 1909 to 1913, and graduated M.B., B.S. in March, 1914. After a short period as resident

medical officer of a public hospital, he joined the A.A.M.C. in 1916, and was sent to Egypt, where he was attached to the 4th Divisional Ammunition Column at Serapuem. He was in England for a time in the early part of 1917 with the A.I.F., and at the end of June was sent to the 1st Australian General Hospital in France. From there he went to the front and was attached successively to the 1st Battalion, 1st Field Ambulance, 3rd Field Ambulance, and 10th Battalion. With this last unit he went into action at Jeancourt, and was killed while attending to the wounded on the first day of the last operations carried out by the 1st Australian Division.

# Obituary.

## SIR JAMES SAWYER, M.D., F.R.C.P. LOND., F.R.S. EDIN.,

CONSULTING PHYSICIAN TO THE QUEEN'S HOSPITAL, BIRMINGHAM.

Sir James Sawyer, who died at his residence at Hatton, Warwick, on Jan. 27th, aged 75, was the eldest son of the late James Sawyer of Carlisle, and was educated at Queen's College, Birmingham. He qualified as a member of the Royal College of Surgeons of England in 1866, and in the following year graduated in the University of London as M.B. with first class honours. He was then appointed resident physician and medical tutor at the Queen's Hospital, Birmingham, a post which he held for several years. In 1875, having proceeded to the M.D. London, he was appointed professor of pathology at Queen's College, Birmingham, where three years later he became professor of materia medica, holding the chair for seven years, when he became professor of medicine. In 1879 he was elected physician at Queen's Hospital, and became F.R.C.P. Lond. in 1883, and after 22 years' service he became consulting physician to the hospital. He was knighted in 1885. In 1908 he delivered the Lumleian lectures at the Royal College of Physicians of London on "Points of Practice in Maladies of the Heart."

He was a man of many activities, being ex-president of the Midland Medical Society, the Birmingham branch of the British Medical Association, the Birmingham Medical Benevolent Society, and the Birmingham Clinical Board. He was also founder and first editor of the *Birmingham Medical Review*, vice-president of the Therapeutics Section, International Medical Congress of London, 1913, president of the Warwickshire Chamber of Agriculture in 1902, and Justice of the Peace for Warwickshire and Birmingham. He was author of numerous contributions to practical medicine. He also took a strong part in Birmingham politics. He was president of the Birmingham Conservative Association in 1885, and in those forceful days he never became reconciled to the Conservative alliance with the Liberal Unionist Party.

Sir James Sawyer married a daughter of the late Rev. J. Harwood Hill, and leaves a widow and two sons, of whom the elder, Lieutenant-Colonel J. E. H. Sawyer, Administrator of the 1st Southern General Hospital, is assistant physician of the General Hospital, Birmingham.

DEATH OF DR. WILLIAM GEORGE KEMP.—Dr. W. G. Kemp, of Oakhurst, Hastings, died with tragic suddenness while in a tramcar on Jan. 24th. Dr. Kemp was born at Alnwick in 1846, and educated at King's School, Canterbury, and St. Bartholomew's Hospital. After qualifying M.R.C.S. and L.R.C.P. Lond., he was house surgeon at Nelson Hospital, N.Z., and in 1870 began practice in Wellington, N.Z., holding the appointment of surgeon to the Wellington Hospital, and having a wide consulting general practice. He was the first surgeon to perform ovariotomy in New Zealand, where he was highly esteemed for his skill and sterling character. He returned to England in 1892 and took the M.D. Durham, but retired from all practice shortly afterwards. Dr. Kemp married Charlotte, daughter of Dr. J. D. Greenwood, and leaves a widow, four sons, and three daughters. One daughter, a King's College Hospital sister, was killed by a German bomb while working at a Red Cross hospital in Belgium. One son is Major in the N.Z. Medical Corps, one Captain, R.A.M.C., and a third son is in medical practice in New Zealand.

PLAGUE and cholera are reported in the Indian gold-fields and are causing anxiety to the authorities.

# Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Final Examination, held from Jan. 14th to 28th, the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas:—

*Medicine.*—J. H. Allan, Liverpool; G. A. E. Barnes and B. F. Behman, Univ. Coll.; T. G. D. Bonar, Guy's; Sarah Aileen Florence Boyd-Mackay, Royal Free; H. M. Brown, Guy's; E. E. Carter, St. Thomas's; C. K. Cullen, London; Sylvia Victoria Elman, St. Mary's; V. N. Fenton, Cambridge and London; H. H. Goodman, Leeds; C. Griffith-Jones, St. Bart.'s; E. A. Hardy, Charing Cross; W. B. Hargreaves, Manchester; M. S. Hashish, St. Bart.'s; H. C. Hopkinson, Cambridge and Manchester; R. Jenner-Clarke, London; S. Kelly, Manchester; Muriel Mercer Kenworthy, Royal Free and Liverpool; M. A. Keshvalu, Hyderabad and Univ. Coll.; E. D. Macmillan, St. Bart.'s; A. A. E. S. Mansour, Charing Cross; J. S. Moore, St. Thomas's; Eva Morton, Royal Free; J. L. Nisbet, St. Bart.'s; A. A. Osman, Guy's; Sigrid Letitia Sharpe Pearson, Royal Free; G. A. Pennant, Bristol; Norah Dorothy Pinkerton, Royal Free; Enid Margaret Mary Quaife, St. Mary's; W. A. Richards, Charing Cross; H. S. Robinson, London; A. E. Sawday, Guy's; A. H. Whyte, Durham; S. C. de S. Wijeyeratne, Univ. Coll.; Ethel Dorothy Will's, Manchester; M. Wong, St. Thomas's; and G. R. Woodhead, London.

*Surgery.*—R. J. Allison, Manchester; W. E. Bracey, Birmingham; T. Fernandez, Cambridge and Guy's; Margaret Hammond, Royal Free; B. C. Hardiman, Queen's Univ.; H. Kamal, King's Coll.; V. G. Mobile, Grant Medical College; C. F. Newman, Birmingham; J. S. Rogers, King's Coll.; M. L. Schroeter, Zurich Univ.; E. N. Showell-Rogers, Cambridge and St. Thomas's; and E. R. Webb, Guy's.

*Midwifery.*—W. S. Adams, Birmingham; W. J. McB. Allan, Guy's; H. E. Archer, St. Bart.'s; B. A. Astley-Weston, Bristol; P. C. Brett, St. Thomas's; E. F. Brown, Birmingham; J. D. M. Cardell, St. Thomas's; I. J. Cruchley, London; G. L. Cutts, Guy's; Sarah Helen Davies, Royal Free; A. M. El-Mishad, King's Coll.; A. H. El Rakshi, Univ. Coll.; C. W. Emley, London; Kathleen Field and J. O'F. Fletcher, St. Mary's; W. T. Flooks, Guy's; L. P. Garrod, Cambridge and St. Bart.'s; St. G. B. D. Gray, Guy's; Dorothy Margaret Greig, Royal Free; Mary Isabel Alleyne Grimmer, Charing Cross; T. L. Hillier, Cambridge and St. Thomas's; F. G. Hobson, Oxford and St. Thomas's; Mabel Marian Ingram, Royal Free; S. W. Jeger, London; S. Kelly, Manchester; R. C. B. Ledlie, Guy's; J. N. Leitch, St. Bart.'s; T. I. Makar, Middlesex; C. Nicory, St. Thomas's; J. L. Nisbet, St. Bart.'s; J. L. C. O'Flyn, St. George's; F. R. Oliver, Cambridge and St. Bart.'s; G. Packham, Cairo and Guy's; W. W. Payne, Guy's; F. F. Petersen, London; G. S. B. Philip, Charing Cross; J. Prevjansky, London; R. R. B. Roberts, Liverpool; H. T. Roper-Hall, Birmingham; R. E. R. Sanderson, St. Bart.'s; E. R. Sarra, Cambridge and London; H. N. Schapiro, Guy's; F. P. Schofield, St. Bart.'s; F. G. Spear, Cambridge and St. Thomas's; Doris Elsie Florence Stanton, Birmingham; J. G. Strachan, Toronto; A. Sudki, Birmingham; C. Suffern, Cambridge and St. Thomas's; S. R. Tattersall, St. Thomas's; R. Thursz, King's Coll.; W. A. Turner, Guy's; N. S. B. Vinter, St. Bart.'s; W. Walsham, St. Mary's; C. J. L. Wells and J. S. White, St. Bart.'s; A. H. Whyte, Durham; Octavia Margaret Wilberforce, Royal Free and St. Mary's; May Grant Williams, Royal Free; C. B. Wilson, Cambridge and Univ. Coll.; and A. E. Young, Bristol.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The following candidates having conformed to the by-laws and regulations and passed the required examinations have been granted licences to practise physic:—

Iskander Mikhail Abd-el-Said, Univ. Coll.; Wilfred Mark Anthony, St. Thomas's; Douglas Albert Raoul Aufranc, Middlesex; Percy Banbury, St. Thomas's; Hezekiah Barbash, Cambridge and St. Bart.'s; John Myles Bickerton, Cambridge and King's Coll.; *Ursula Poussett Blackwell, Royal Free; Edward Phillimore Brockman, Cambridge and St. Thomas's; Jacob Brodetsky, London; Jean Bbo sy, Lausanne; Charles Henry Bubb, Guy's; Michel Henri Burnier, Lausanne; *Alix Jeanne Churchill, Royal Free and St. George's; Roger Heine Clarke, Cambridge and St. Bart.'s; Cecil Gerald Sedgeley Corner, Madras and Univ. Coll.; Ahmad Rahimtula Rhalak Dina, Bombay and Guy's; Geoffrey Barrow Dowling and Arthur Alan Forty, Guy's; Reginald Stafford Foss, St. Thomas's; Lionel Erulé Frazer, Cambridge and St. Thomas's; Joseph Pinkus Freilich, Univ. Coll.; Edward James Gaffney, Guy's; John Francis Gaha, Dublin and Univ. Coll.; Christopher Frank Good and Boris Abramovitz Morshovitz Gordon, London; Frank Gray, Cambridge and St. Bart.'s; Hubert Oliver Gunewardene, King's Coll.; Arthur Clare Halliwell and Arthur Thomas Hawley, Cambridge and St. Thomas's; Christopher Thomas Helsham, Durham and Guy's; Charles Harold Sterne Horwitz, Guy's; Gilbert Rashleigh Hull, St. Thomas's; Graydon Oscar Hume, Guy's; Tom Aubrey Jones, Cambridge; Henry David Kelf, St. Bart.'s; Francis William Kemp, Charing Cross; Gdal Leizer Levin, Univ. Coll.; Philip Clermont Livingston, Cambridge and London; Pierce Lloyd-Williams and Ernest Kenneth Macdonald, St. Thomas's; John Alexander Mackenzie, Manitoba; Charles Fergus McLean, Cambridge and St. Thomas's; *Malati Madgavkar, Birmingham; Charles Dundas Maitland, St. Thomas's; Hugh Bethune Maitland, Toronto; Humphrey Ingilby Marriner, St. Thomas's; Samuel Raynor Meaker, Harvard; Anakara Vadakath Radhakrishna Menon, Madras and Univ. Coll.; David Richard Owen, Liverpool; Aerath Narayanan Nanco Panikker, Edinburgh; *Dorothy Priestley Priestley, Leeds; Rowan William Revell, Univ. Col.; Rupert Idris Rhys, St. Bart.'s; Francis Henry Smith, Cambridge and St. George's; Francis Rupert Snell, St. Thomas's and Durham; Robert James Staley, Birmingham; Howard William Copland Vines, Cambridge and St. Bart.'s;

Arthur Elston Ward and Evelyn Cecil Whitehall-Cooke, St. Thomas's; Roger Lester Williams, Cambridge and St. Bart.'s; Sik To Wong, Guy's; Raymond Benedict Hervey Wyatt, Oxford and St. George's; Harold Blacow Yates, Cambridge and St. George's; and Frank Young, Guy's.

* Under the Medical Act, 1876.

Diplomas in Public Health were granted conjointly with the Royal College of Surgeons of England to the following candidates:—

George Alexander Birnie, John Alexander Drake, Thomas Hill Jamieson, Arcot Doraisawmy Loganadan, Keith Myrie Benoit Simon, Philip Smith, and John Wotherspoon.

THE MEDICAL MEETING AT WIGMORE HALL.—At the meeting of the medical profession which took place at the Wigmore Hall, Wigmore-street, London, on Sunday last, under the chairmanship of Mr. Fielding-Ould, a singular position was reached. The following resolution was proposed, seconded, and carried by 182 votes to 93.

In view of prospective legislation and the proposed establishment of a Ministry of Health, and having regard to the experience of the medical profession at the time of the passing of the National Insurance Acts, the time has arrived when a body representative of the whole profession should be established, to watch its interests and be prepared to act in an advisory capacity as occasion demands.

The opposition to this resolution came from the representatives of the British Medical Association, who protested against the formation of any such body on the grounds that the medical profession had in the Association a body capable of acting in the proposed manner. The meeting being now definitely committed to the formation of a new body, the following resolution was proposed and seconded:—

That a provisional committee be now formed with the object of securing the election of such a body.

To this resolution the following amendment was proposed and seconded:—

"That this meeting of the medical profession, in view of the urgency arising from contemplated legislation, approves the recognition of the Parliamentary Medical Committee as the provisional committee to be entrusted with the task of drawing up the constitution of a body to develop along the lines indicated by the first resolution."

The amendment on going to division was negatived by 105 to 87 in a dwindling meeting. A second amendment to the resolution was then proposed in the following terms:—

"That in the opinion of this meeting no committee or organisation is capable of effectively representing the interests of the profession unless it is a registered medical trade union."

This amendment, being seconded, went to division and was announced by the Chairman to have been lost by 73 votes to 71, those being the figures of the count. The supporters of the amendment demanded a recount, which the chairman ruled to be impossible as members of the meeting who had voted had already left the building. The meeting refused to accept the chairman's ruling, who thereupon left the platform.

The result of the meeting, therefore, was to decide that a new body should be formed in accordance with the first resolution, while the second resolution, under which the actual formation of such a body should have taken place, was never reached, and the two amendments to it failed to secure the necessary support. No action, it would seem, arises from the meeting.

THE CHILD-STUDY SOCIETY OF LONDON. — A course of five lectures on alternate Thursdays at 6 P.M. begins on Feb. 13th at the Royal Sanitary Institute (90, Buckingham Palace-road, London, S.W.1), when Mr. C. W. Kimmins, M.A., D.Sc., deals with the Significance of Children's Dreams. Dr. Eric Pritchard gives the concluding lecture on Home *versus* Institutional Training of Young Children. The lectures will be announced in the Medical Diary.

LEPERS IN INDIA.—An Indian auxiliary to the Mission to Lepers, which has been working for 44 years, has just been formed in Simla by Lady Chelmsford, wife of the Viceroy. The work of the Mission is to be the subject of a series of lantern lectures in important centres by the secretary of the Mission. The modern treatment for leprosy is to be promoted under a committee presided over by the Director-General of the Indian Medical Service. Sir Leonard Rogers and the secretary are drawing up a scheme for the trial of new remedies in the 60 leper asylums conducted by the Mission.

MEDICAL SOCIETY OF LONDON.—The programme for the second half of the 1918-19 season includes a paper by Sir StClair Thomson on the Operation by Laryngo-fissure (Feb. 10th) and by Mr. R. A. Ramsay on Congenital Hypertrophy of the Pylorus (Feb. 24th). On March 10th, 17th, and 24th Dr. W. H. Willcox, Colonel, A.M.S., will deliver the Lettsomian lectures on a subject to be announced later. The annual oration will be delivered by Sir John Tweedy on May 12th, following the general meeting. The ordinary meetings will be held at 8.30 P.M., the general meeting at 8 P.M., and the Lettsomian lectures at 9 P.M.

# Appointments.

ROWLAND, STEPHEN, M.B. Edin., D.P.H. Camb., has been appointed temporary Tuberculosis Officer for Northampton.

# Vacancies.

*For further information refer to the advertisement columns.*

*Ashford, Kent. Grosvenor Sanatorium, Kennington.*—Res. Asst. M.O.
*Birkenhead Borough Hospital.*—Jun. H.S. £170.
*Birmingham Corporation Pre-Maternity and Infant Welfare Work.*—Female Doctor. £350.
*Bradford Union.*—Asst. M.O. £400.
*Buenos Aires. British Hospital.*—Senior R.M.O. and Asst. R.M.O. £500 and £450.
*Folkestone, Royal Victoria Hospital.*—H.S. £150.
*Glamorgan County Council.*—Inspection of Children in Public Elementary Schools.—Three M.O.'s. £400.
*Huddersfield Royal Infirmary.*—Jun. H.S. £100.
*Johannesburg, South African School of Mines and Technology.*—Professors of Anat. and Physio. £1000 in each case.
*King George Hospital, Stamford-street, S.E.*—Res. H.S. £1 per diem.
*Leeds Hospital for Women and Children.*—Hon. Asst. S.
*Liverpool Eye and Ear Infirmary.*—Hon. Asst. Surgeons.
*Manchester, St. Mary's Hospitals.*—Hon. Asst. S. for Women.
*National Hospital for Diseases of the Heart, Westmoreland-street, W.*—Res. M.O. £100.
*Newcastle-upon-Tyne Poor-law Infirmary.*—Female Asst. Res. M.O. £250.
*Northampton General Hospital.*—Jun. H.S. £150.
*Nottingham City Asylum.*—Junior Asst. M.O. £300.
*Portsmouth Corporation Mental Hospital.*—Jun. Asst. M.O. £250.
*Royal Free Hospital, Gray's Inn-road, W.C.*—Clin. Asst.
*Royal National Orthopædic Hospital.*—Res. H.S. £100.
*St. Thomas's Hospital, S.E.*—Asst. Bacteriologist. £400. Also Asst. Pathologist and Demonstrator of Morbid Anatomy. £250.
*Sheffield Royal Hospital.*—Cas. O. £130. Also Asst. H.P. £120.
*Smethwick County Borough.*—M.O.H. £800.
*Stoke-on-Trent County Borough.*—Temp. Tuberc. O. £550.
*Sunderland Royal Infirmary, Children's Hospital.*—Res. M.O. £200.
*University of London.*—Examiners.
*Walsall General Hospital.*—H.S. and Anæsthetist. £175.
*Warwickshire County Council.*—Asst. M.O.H. £400.
*Western Ophthalmic Hospital, Marylebone-road, N.W.*—Vacancies on Medical Staff.
*West Ham Union Sick Home, Forest-lane, Stratford, E.*—Temp. Res. Asst. M.O. £6 6s. per week.
*Westmorland County Council.*—Female Asst. M.O. £400.
*Windsor, King Edward VII. Hospital.*—Asst. Hon. S.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Wolston (Warwick).

# Births, Marriages, and Deaths.

## BIRTHS.

ABEL.—On Jan. 25th, at Endsleigh-street, W.C., the wife of A. Lawrence Abel, M.B., B.S. Lond., temporary Surgeon-Lieutenant, R.N., of a son.

BATE.—On Jan. 23th, at Hove, the wife of Captain A. G. Bate, R.A.M.C. (T.F.), of a daughter.

BELL.—On Jan. 28th, at Ravenscroft, Luton, Bedfordshire, the wife of Dr. R. D. Bell, M.C., of a daughter.

CORDNER.—On Jan. 31st, at Gladholm, Andover-road, Cheltenham, the wife of Major E. R. Cordner, A.A.M.C., of a son.

COWEN.—On Feb. 2nd, at Claremont-avenue, Blackpool, the wife of Captain (acting Major) E. G. H. Cowen, R.A.M.C., of a son.

DAVID.—On Jan. 21st, at "Delmar," Babbacombe, Torquay, the wife of Captain W. E. David, M.C., R.A.M.C., of a daughter.

HARRISON.—On Jan. 23rd, the wife of Captain W. L. A. Harrison, M.C., R.A.M.C., of a daughter (stillborn).

HEDLEY.—On Feb. 1st, at Harley-street, the wife of Captain John Prescott Hedley, R.A.M.C. (T.), of a son.

LONGSTAFF.—On Jan. 21st, at Thorn'hill, St. Mary's road, Ditton-hill, Surbiton, the wife of Captain E. R. Longstaff, R.A.M.C. (S.R.), of a daughter.

TAYLOR.—On Jan. 28th, at Church Circle, Farnborough, the wife of Major James Taylor, R.A.M.C., of a son.

## MARRIAGES.

BLAIR—STEEGE.—On Dec. 27th, 1918, at St. Matthias Church, Richmond, Surrey, Charles James Longworth Blair, Surgeon, R.N., to Lilian, daughter of Mr. and Mrs. F. W. Steege, of Richmond.

BOOTH—ALLEN.—On Jan. 20th, at St. George's, Hanover square, Major Ernest Brabazon Booth, D.S.O., R.A.M.C., to Marguerita Agnes, widow of Captain Leslie J. S. Allen, The Hampshire Regiment.

## DEATHS.

FISHER.—On Feb. 3rd, at Walmer, Kent, James William Fisher, M.D., Inspector-General, R.N., aged 72.

LOGIE.—On Feb. 1st, at the 1st Northern General Hospital, Newcastle-on-Tyne, of pneumonia, Captain A. G. S. Logie, R.A.M.C. (T.F.), aged 53.

TURNER.—On Feb. 3rd, at Lullington-road, Anerley, Robert Turner, M.R.C.S., A.M.S. (retired), in his 86th year.

*N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

# Medical Diary for the ensuing Week.

## SOCIETIES.

**ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.1.**

**Wednesday, Feb. 12th.**

SOCIAL EVENING: at 8.30 P.M.

Sir Arbuthnot Lane will discourse on some aspects of "Stasis." The Library will be open and visitors are invited to raise and discuss any question in which they are interested. (Tea, coffee, and smoking.)

Medical Officers of the Navy, R.A.M.C., the Dominions, United States, and the Allies are cordially invited.

*MEETINGS OF SECTIONS.*

**Thursday, Feb. 13th.**

NEUROLOGY (Hon. Secretaries—C. M. Hinds Howell, E. G. Fearnsides): at 8 P.M.

*Cases* will be shown by the following:—

Dr. Frank Eve, Dr. Farquhar Buzzard, Captain Riddoch, and Mr. Rocyn-Jones.

**Friday, Feb. 14th.**

EPIDEMIOLOGY AND STATE MEDICINE (Hon. Secretaries—William Butler, M. Greenwood): at 5.30 P.M.

*Paper:*

Dr. John Brownlee (Director of Statistics, Medical Research Committee): An Investigation into the Periodicity of Epidemics of Measles in the Large Towns of Great Britain and Ireland.

Members intending to dine are requested to send their names to Captain Greenwood, 7, Northumberland-street, W.C. 2, not later than Feb. 12th.

**The Royal Society of Medicine keeps open house for R.A.M.C. men and M.O.'s of the Dominions and Allies. The principal hospitals in the metropolis admit medical officers to their operations, lectures, &c. Particulars on application to the Secretary at 1, Wimpole-street, London, W.1.**

**MEDICAL SOCIETY OF LONDON, 11, Chandos-st., Cavendish-sq., W.**

MONDAY, Feb. 10th.—8.30 P.M., Paper:—Sir StClair Thomson: Intrinsic Cancer of the Larynx. Operation by Laryngo-fissure and its Results (sequel to a paper read before the Society on Feb. 12th, 1912).

**MEDICO-LEGAL SOCIETY, at the Rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W.**

TUESDAY, Feb. 11th.—8 P.M., Council Meeting. 8.30 P.M., Papers:—Dr. Spilsbury: Criminal Abortion.—Dr. H. C. Ross (introduced by Mr. R. H. Wellington): A New Combined Test for the Presence of Albumin and Sugar in Urine.

**HUNTERIAN SOCIETY, at the Rooms of the Royal Society of Medicine, 1, Wimpole-street, W.**

WEDNESDAY, Feb. 12th.—9 P.M., Annual Oration:—Mr. H. Lett: John Hunter and his Influence on Urinary Surgery.

**ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.**

WEDNESDAY, Feb. 12th.—4.30 P.M., Paper:—Sir Frank Heath, K.C.B.: The Government and the Organisation of Scientific Research.

**CHILD-STUDY SOCIETY LONDON, at the Royal Sanitary Institute, 90, Buckingham Palace-road, S.W.**

THURSDAY, Feb. 13th.—6 P.M., Lecture:—Dr. C. W. Kimmins: The Significance of Children's Dreams.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

**ROYAL COLLEGE OF SURGEONS OF ENGLAND, in the Theatre of the College, Lincoln's Inn Fields, W.C.**

WEDNESDAY, Feb. 12th.—5 P.M., Hunterian Lecture:—Prof. A. Fleming: The Action of Chemical and Physiological Antiseptics in Septic Wounds.

**POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.**

**Clinics each week-day at 2 P.M., Wednesday, Friday and Saturday also at 10 A.M.**

**(Details of Post-Graduate Course were given in issue of Feb 1st.)**

**NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.**

Out-patients each day at 2.30 P.M.

**NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C.**

Emergency Post-Graduate Course in Neurology:—

MONDAY, Feb. 10th.—2 P.M., Medical Out-patients: Dr. Collier. 3.30 P.M., Lecture:—Dr. H. Howell: Anatomy and Physiology of Nervous System.

TUESDAY.—2 P.M., Medical Out-patients: Dr. G. Stewart. 3.30 P.M., Ward Cases: Dr. R. Russell.

WEDNESDAY.—2 P.M., Lecture:—Mr. Sargent: Surgery of Nervous System. 3.30 P.M., Lecture:—Dr. G. Holmes: Methods of Examination of Cases.

THURSDAY.—2 P.M., Medical Out-patients: Dr. F. Buzzard. 3.30 P.M., Lecture:—Dr. H. Howell: Anatomy and Physiology of Nervous System.

FRIDAY.—2 P.M., Medical Out-patients: Dr. G. Holmes. 3.30 P.M., Ward Cases: Dr. Tooth.

**ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.**

TUESDAY, Feb. 11th.—4 P.M., Dr. J. L. Bunch: Some Common Skin Diseases. 5 P.M., Dr. W. K. Sibley: Syphilis and its Treatment.

WEDNESDAY.—5 P.M., Dr. W. Griffith: Skin Diseases in the Army.

**UNIVERSITY OF LONDON, KING'S COLLEGE, AND KING'S COLLEGE FOR WOMEN.**

Course of Six Public Lectures arranged in conjunction with the Imperial Studies Committee of the University on Physiology and National Needs:—

WEDNESDAY, Feb. 12th.—5.30 P.M., Lecture II:—Dr. M. S. Pembrey: Physical Training of the Open-Air Life.

**KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON), at the Lecture Theatre of the Medical School, King's College Hospital, Denmark Hill, S.E.**

Course of Four Lectures on Malaria. Microscopic specimens and lantern slides will be shown at the two last lectures.

FRIDAY, Feb. 14th.—12 noon, Lecture III.:—Col. Sir Ronald Ross, K.C.B., K.C.M.G., F.R.S. Officers and Men of the Royal Army Medical Corps are invited to attend.

**ROYAL INSTITUTE OF PUBLIC HEALTH, in the Lecture Hall of the Institute, 37, Russell-square, W.C.**

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY, Feb. 12th.—4 P.M., Right Hon. the Viscountess Rhondda: Women's Place in the Ministry of Health.

## BOOKS, ETC., RECEIVED.

BAILLIÈRE, TINDALL, AND COX, London.
Intensive Treatment of Syphilis and Locomotor Ataxia by Aachen Methods. By R. Hayes, M.R.C.S. 3rd ed. 4*s.* 6*d.*

BALE, JOHN, SONS, AND DANIELSSON, London.
Science and Art of Deep Breathing as a Prophylactic and Therapeutic Agent in Consumption. By Shozaburo Otabe, M.D. 5*s.*
Lenzmann's Manual of Emergencies—Medical, Surgical, Obstetric: Their Pathology, Diagnosis, and Treatment. By J. Snowman, M.D. 15*s.*

CASSELL AND CO., London.
The Doctor in War. By Woods Hutchinson, M.D. 7*s.* 6*d.*

FROWDE, HENRY, AND HODDER & STOUGHTON, London.
Trench Fever. Report of Commission, Medical Research Committee, American Red Cross. 2*s.*
Orthopædic Effects of Gunshot Wounds and their Treatment. By S. W. Daw, Captain, R.A.M.C. (T.F.). With Foreword by Major-General Sir R. Jones and Appendix on Functional Disabilities by Dr. W. Cuthbert Morton. 7*s.* 6*d.*

KIMPTON, HENRY, London.
Physiology and Biochemistry in Modern Medicine. By J. J. Macleod, M.B., and Others. 37*s.* 6*d.*
Roentgen Diagnosis of Diseases of the Head. By Dr. Arthur Schuller. Translated by F. F. Stocking, M.D. 21*s.*
Essentials of Medical Electricity. By E. P. Cumberbatch, B.M. 4th ed., revised. 7*s.* 6*d.*
Genito Urinary Diseases of Syphilis. By H. H. Morton, M.D. 4th ed., revised.

LEWIS, H. K., AND CO., LTD., London.
The Epidemics of Mauritius. With a Descriptive and Historical Account of the Island. By Daniel E. Anderson, M.D. Lond. and Paris. 16*s.* net

LONGMANS, GREEN, AND CO., London.
Experimental Education. By R. Rusk, M.A. 7*s.* 6*d.*

UNIVERSITY OF LONDON PRESS, London.
Crime and Criminals. By Charles Mercier, M.D. 10*s.* 6*d.*

WRIGHT, JOHN, AND SONS, LTD., Bristol. SIMPKIN, MARSHALL, London.
Pye's Surgical Handicraft. Edited by W. H. Clayton-Greene, F.R.C.S. 21*s.*

## Communications, Letters, &c., to the Editor have been received from—

A.—*Arts Gazette*, Lond.; Major C. Armstrong, R.A.M.C.

B.—Dr. A. G. Bateman, Lond.; Dr. R. A. Bennett, Torquay; Surg.-Lieut. R. A. Barlow, R.N.; Mr. R. Basu, Calcutta; Prof. W. M. Bayliss, Lond.; Mr. T. W. Bassett, Cork; Mr. C. Burroughs, Atascadero, California; Board of Agriculture and Fisheries, Lond.; Dr. H. Brown, Lond.; Dr. C. Burland, Liverpool; Dr. W. H. Bowen, Cambridge.

C.—Chicago School of Sanitary Instruction; Mr. H. Curtis, Lond.; Dr. R. L. Collis, Lond.; Mr. C. H. Cutting, Lond.; Mr. F. P. de Caux, Lond.; Dr. G. S. Candy, Great Bookham; Child Study Society, Lond.; Capt. C. M. Craig, R.A.M.C.; Col. S. L. Cummins, C.M.G., A.M.S.

E.—Dr. H. A. Ellis, Middlesbrough; Dr. J. Eyre, Lond.

F.—Capt. J. G. Forbes, R.A.M.C.; Mr. C. Fitch, Lond.; Capt. S. D. Fairweather, R.A.M.C.; Sgt. H. A. French, R.A.M.C.; Dr. E. R. Fothergill, Hove.

G.—Dr. A. K. Gordon, Lond.; General Medical Council, Lond., Acting Registrar of.

H.—Mr. T. G. Hill, Lond.; Bt.-Col. L. W. Harrison, D.S.O.; Dr. C. M. H. Howell, Lond.; Dr. I. Harris, Liverpool.

J.—Mr. F. Jebb, Crowborough; *Journal of Immunology*, Baltimore.

K.—Prof. H. Kenwood, Lond.; Dr. W. Kidd, Cheltenham; Dr. W. H. Kesteven, Kingston Hill.

L.—Prof. D. Ligat, Lond.; Mr. J. Lewenstein, Hull; Dr. C. Lillingston.

M.—Dr. H. J. May, Southampton; Capt. D. M. MacRae, S.A.M.C.; Medical Society of London; Capt. J. Miller, R.A.M.C.(T.)

O.—Dr. J. Oliver, Lond.; Mr. J. Offord, Lond.

R.—Hon. N. C. Rothschild, Lond.; Mr. T. G. Read, Blackgang; Monsieur G. Roussy, Paris; Dr. J. W. Rob, Weybridge; Capt. H. H. Read, R.A.M.C.; Royal Institution, Lond.

S.—Dr. C. F. Sontag, Lond.; Dr. G. E. Shuttleworth, Lond.; Lady Henry Somerset, Lond.; Dr. G. de Swietochowski, Lond.; Mr. W. D. Spanton, Hastings.

T.—Dr. A. H. Thompson, Lond.

W.—Prof. A. J. Walton, Lond.; Mr. H. Whitley, Colchester; Major E. A. Willcocks, A.I.F.

Y.—Miss M. Yates, Lond.

Communications relating to editorial business should be addressed exclusively to The Editor of THE LANCET, 423, Strand, London, W.C. 2.

# Notes, Short Comments, and Answers to Correspondents.

## LESSONS OF THE INFLUENZA EPIDEMIC.

ON Jan. 29th, at the Royal Institute of Public Health, a lecture on Lessons of the Influenza Epidemic was delivered by Captain T. Carnwath, D.S.O., medical inspector to the Local Government Board. He said that Dr. Bruce Low had pointed out that the epidemic had probably originated in the East, and not in Spain as was at first thought. Influenza in epidemic form was prevalent in France and in our own armies as early as April, 1918, the gradual diffusion of the epidemic from populous centres to outlying rural districts being explained by the short incubation period, the sudden onset, the high infectivity of the patients during the first days of illness, and the fact that no one seemed to enjoy immunity, at any rate when the epidemic had attained its pandemic stride.

A short account was then given of the clinical features of the epidemic in the summer outbreak, and Captain Carnwath then discussed the various preventive means at our disposal. Quarantine had been suggested as a means of controlling the disease, but was not very practicable. Some system of notification was required, together with opportunities for research. The importance of isolation as a measure of prophylaxis could not be too strongly urged, the isolation of severe cases being insisted upon; it would almost certainly result in a considerable diminution of the severity of the disease. The use of face-masks required more indisputable evidence as to their efficacy. The mouth and nose should be disinfected, especially after attendance at a crowded meeting or where a number of people were congregated together. On the other hand, it had been suggested that the natural resistance of the tissues to invasion by microbes might be lowered by lavage. It was impossible for any permanent health staff to cope unaided with a large epidemic of this kind, and in matters of public health it was necessary to obtain the cooperation of the public. For this there should be a greater diffusion of knowledge. The newspapers for a long time had had a city page dealing with financial matters, and he did not see why they should not publish a health page under competent medical editorship, where carefully considered accounts could be given of recent advances in preventive medicine. Research work, too, was greatly needed; we had been indifferent about it for too long in this country.

Sir Arthur Newsholme, who presided, said that the non-preventability of influenza had been cast as a reflection on preventive medicine, but that was answered by pointing to its triumphs over such diseases as typhoid fever, malaria, typhus, small-pox, &c. In the case of influenza we were waiting for further research to enable us in some way or another to secure immunity from attack, but possibly we should have to work for many decades on a much larger scale before catarrhal infections could be prevented. Influenza spread with lightning rapidity, and before it was recognised many thousand cases might occur; the disease got ahead long before communal means could overtake it. It was here that educational measures were necessary, measures which would also raise the standard of conduct of the ordinary man or woman whom one met in the tram or tube or in other places, especially with regard to sneezing and other insanitary habits. Until everyone adopted the most rigid precautions we could not hope for greater success. In the future he had no doubt that face-masks of a modified kind would be used more generally during epidemics. Every doctor and sick nurse ought to take that precaution. The palpebral, as well as the nasal, mucous membranes should be protected. If any further epidemic occurred it would be necessary to organise teams of doctors and nurses to go from one area to another. This had been done to some extent during the present epidemic, but such measures would no doubt in future have to be carried on on a larger scale.

Dr. W. A. Bond said that his experiences in dealing with the epidemic confirmed the doubt as to the causal nature of Pfeiffer's bacillus; it was desirable that as much research work as possible should be undertaken.—Dr. R. J. Ewart said that endemic and epidemic influenza were as distinct from each other as measles was from whooping-cough.—Captain Baily spoke of his experiences in Mesopotamia, and said that he believed the severity of the disease was lessened by treating the cases in tents in the open air. With the exception of one case of bronchitis and one of slight heart affection, the symptoms had passed off normally within three to four days.

In his reply to a question by Dr. T. N. Kelynack, the lecturer said that the evidence from open-air sanatoriums was rather conflicting, some institutions appearing to have escaped, whilst others had been less fortunate.

## COLONIAL HEALTH REPORTS.

*Northern Territories of the Gold Coast.*—The Census, completed in 1911, gave an estimated population of 361,806 to the Northern Territories—an average of 11·6 persons to the square mile. The returns for the Southern and North-Western Provinces were considered to be fairly accurate, but those of the North-Eastern Province fell far short of being correct, and it is estimated that not more than two-thirds of the inhabitants were enumerated. Systematic work is being carried out to render the next Census returns reliable in every respect. In spite of the heavy infant mortality, it is considered that the population at the present day is greatly in excess of that shown in the last Census returns. An outbreak of small-pox occurred in the North-Western Province in December, 1916, and continued into 1917. Some men of the Northern Territories Constabulary, with their families, were allowed to go to Tamale from the infected area, with the result that 10 cases of small-pox, with 3 deaths, occurred. The disease also spread from Wa to Bole, but in each case the outbreak was quickly suppressed. Small-pox again broke out in the North-Western Province in November, and it is thought that the natives spread the disease by vaccinating themselves from infected cases. In spite of repeated warnings a number of fatal cases of anthrax occur annually among the natives, due to their ineradicable propensity to eat the meat of cattle that have died from that disease. Leprosy is not on the increase, and while uncommon in the Southern and North-Western Provinces is of more frequent occurrence in the North-Eastern Province. The natives look upon it as "a visitation of Allah," but say that it shows no signs of spreading, and are generally averse to compulsory isolation. There are Government native hospitals established at Tamale, Salaga, and Bole in the Southern Province; at Wa, Tumu, and Lorha in the North-Western; and at Gambago, Zouaragu, and Bawku in the North-Eastern Provinces. The first two hospitals mentioned are permanent buildings constructed by the Public Works Department; the others are built of "swish," or sun-baked bricks and are thatch-roofed, but little, if any, advantage is taken of them by the natives where medical officers are not in residence. The total of in-patients treated during the year was 178 and of out-patients 5045; there were 10 deaths and 22 operations under anæsthetic.

*St. Helena.*—The estimated civil population on Dec. 31st, 1917, was 3634, as compared with 3604 on the corresponding date in 1916. The birth-rate in 1917 was 26·41 per 1000, and the death-rate 13·7 per 1000. Of the deaths registered 14 were of persons over 70, 8 over 80, and 1 over 90 years of age. Early in the year there were epidemics of dysentery and influenza, both of a mild type and causing no deaths. Later in the year these maladies reappeared in a more serious form and directly or indirectly accounted for several deaths. A mild outbreak of chicken-pox occurred in December, necessitating the closing and disinfecting of all schools. There were no cases of diphtheria or enteric fever. Frequent shortage of food supplies threatened seriously to undermine the health and stamina of the people, especially those dwelling in and around Jamestown. The entire want of any qualified dental attention in the island, beyond the extraction of teeth by the colonial surgeon, tends to affect the general health in an increasing degree. The enervating climate, the nature of the water, and the high consumption of sugar by the inhabitants all tend to make dental caries very rapid, and to this want of dental attention the general low stamina of the inhabitants is mainly due. The keeping of pigs in Jamestown for the purpose of augmenting the food-supply was recommended by a majority of the members of the Board of Health, but was disallowed for medical and sanitary reasons, records showing that, in years gone by, diseases were traceable to the keeping of pigs in the proximity of dwelling-houses in the tropical climate and confined limits of Jamestown Valley. There were 139 admissions to the hospital during the year, 85 being males and 54 females; there were 11 deaths. The lady superintendent returned from leave early in the year. Of the three nurses, two completed their three years in the colony in March and November respectively, but nurses could not be obtained to relieve them. The former of these remained at duty until August, when she was obliged through ill-health to return to England; the latter was still on duty at the end of the year in spite of bad health. Dr. O. J. Murphy arrived from England in January as acting colonial surgeon.

## A HOSPITAL FOR BOGNOR.

BOGNOR is to have a cottage hospital as a war memorial, Springfield House, Chichester-road, being the venue. This property is to be purchased for £3000, and £1000 are to be spent on its equipment. Mr. James Fleming is generously providing half of this total sum—viz., £2000, provided the remaining £2000 are raised locally, and, furthermore, Mr. Fleming has given £5000 for an endowment fund. At a meeting under the auspices of the urban district council, which is giving every support to the scheme, nearly £700 were raised towards the £2000.